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ARCHITECTVRE

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DECORATION

CONSTRVCTION

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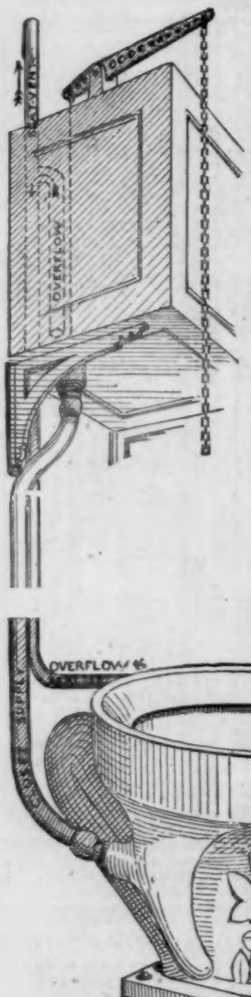
View of the New Public Library, Boston, Mass.

[Gelatine Print issued only with Gelatine and Imperial editions.]

Plans, Section, Interior Court-yard, and Interior of Reading-Room, of the New Public Library, Boston, Mass.

THE

SANITAS WATER CLOSET



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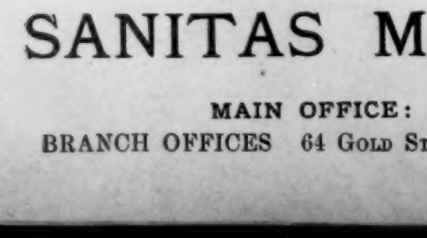

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WE regret sincerely to hear of the death of Mr. Carl Pfeiffer, a distinguished architect of New York, which occurred very suddenly while he was travelling in the South. Mr. Pfeiffer was born in Germany, where he received a very thorough education as an engineer, with which he joined, as is not unusual in Germany, a considerable amount of architectural study. He came to this country about twenty-five years ago, and, after some experience in the West, established himself in New York as an architect. He soon gained high distinction, not only for his designs, of which the fine church on the corner of Park Avenue and, we believe, Thirty-fourth Street, is an example, but for his skill in interior arrangement, and in heating and ventilating his buildings. His most noted work in this branch of the science of architecture is, perhaps, the church known as Dr. Hall's, on Fifth Avenue, which was described by Captain Douglas Galton, one of the best authorities in the world on the subject, who examined the church with great interest, not only as far superior in warming and ventilation to any European structure of the kind, but as presenting a perfection in these respects which had not even been dreamed of on the other side of the Atlantic. We cannot here attempt to give a list of Mr. Pfeiffer's works, which include, besides many private houses, hospitals, churches, apartment-houses, hotels and other buildings, but in all of them great thoroughness and ingenuity of construction were added to a very pure taste, both in composition and detail. In his professional life, Mr. Pfeiffer stood among the first for his high-minded enthusiasm for his art, his strictly honorable practice, and his devotion to professional interests. He was one of the earliest members of the American Institute of Architects, and was always active on committees, or in other ways, wherever he could see an opportunity for advancing professional ethics or efficiency. He was one of the first to welcome the idea of a society for mutual defence, as adopted by the French architects, and endeavored to interest his friends in it, long before it was taken up by the great professional societies. Although his health was always delicate, he was an earnest student as well as an active practitioner, and to a profound knowledge of his art he joined a refinement and courtesy which gained for him the highest regard among those who had the pleasure of his acquaintance.

AT the risk of doing some unintentional advertising, we would like to call the attention of our readers to the new "non-corrodible" iron pipe which has just been placed on the market. It is furnished in cast-iron for waste-pipes and in wrought-iron for supply-pipes, and is claimed to give perfect protection against rust, at a cost little greater than that of the unprotected pipe. The process is said to consist in the impregnation of the iron with hydrogen, a piece of metallurgy which we may leave to experts to discuss, but if the treatment, whatever it is, will really permanently prevent wrought-iron from rusting, we may expect to see a rapid revolution in domestic metal-work. To say nothing of stoves and furnaces, steam, hot-water and smoke pipes, if small hardware can be properly protected in this way, most architects will soon begin the study of wrought-iron details for nearly every portion of their buildings. However bright and attractive brass and bronze may be, they are far inferior in style and artistic quality to wrought-iron, and the day that sees the cheaper metal well designed and skilfully executed, freely used about our houses will be a happy one for architecture.

IN wrought silver and metal work, much of which now is very pretty, the processes are similar, but brazing, or joining with hard solder, is substituted for welding, and the articles produced have not quite the homely fascination of the iron ones. In place of it, however, they may be treated with a perfection of finish unknown to iron. In imitation of the Japanese, the Germans, and still more the Americans, who surpass them in their treatment of silver, decorate the metal with enamels of different colors, or with tints produced by the action of sulphur, or by simple oxidation. Besides the innocent pursuit of fine art in hammered silver, copper and iron, however, the Americans exercise another industry of less commendable character. At present, particularly in Paris, many statuettes, ornaments and small objects are made of cast metal, bronze or zinc, highly finished by hand. Specimens of the best of these are secured by agents in Paris and shipped to New York, where they are sawed in pieces, the pieces used as patterns to make moulds from, and great numbers of castings immediately turned out, which are soldered together, so as to present a tolerable counterfeit of the original object. There is a difference, since the reproduction shows only coarse traces of the beautiful and costly hand finishing of the original, but the resemblance is close enough to secure a sale for a large number of copies at highly remunerative prices.

THE *Wiener Bauindustrie-Zeitung* gives a curious account of the present practice of metal-work, which, we must not forget, owes its revival as one of the most beautiful of the smaller arts to the late Viollet-le-Duc, who educated, with infinite pains, a small body of iron-workers until they were capable of appreciating, and in some degree emulating, the skill of the mediæval blacksmiths. Every one knows that in Germany, particularly about Nuremberg, wrought-iron work is now produced in endless variety, which possesses a charm hardly found in any other detail of architecture, and, as the Germans themselves think, far surpasses in interest and artistic value the brass and bronze work which formerly occupied the place into which it is now rapidly making its way. With the Bavarians a good wrought-iron chandelier is now much more highly prized than one of brass or bronze; and with reason, for the intellectual effort required to execute the iron one is of a much higher order than is needed for the drudgery of filing and polishing brass; and iron candlesticks, match-holders and other small objects, full of interest and style, are in use everywhere as ornaments. It is interesting to know that for a good deal of this sort of work the iron is manipulated cold. The smith takes a piece of bar-iron, and hammers and draws it while hot into a suitable form, avoiding joints and knots. He then draws on a piece of the best sheet-iron the outlines of a leaf or petal. This is formed on the anvil to the modelling desired, by skilful and careful hammering. In the portions which are to be in high relief, the effect of the tool would be to draw the iron out too thin, or even to punch holes in it, if it were not so handled as to move the hot metal from the edges, where some thickness can be spared, to the central portion of the depressions, where it serves to reinforce the places most stretched in working. When the roughing-out is completed, the leaf then varies in thickness according to the modelling of its surface. The veins and surface-markings are then put on by punches, and the edges finished with the file. After this is done, the most difficult part of the work, the welding together of the petals or leaves into flowers and sprays, yet remains, requiring sometimes a hundred heatings of the object, which must be managed within very narrow limits, so as not to burn the

metal by too great heat, or risk imperfect joining by keeping the temperature too low. A second touch of the file, with a coat of fine black paint, completes one of the most charming little objects of household art that can be imagined.

THE subject of the manufacture of cement from iron slag has become an important matter. Not long ago ground slag was often added to Portland cement, but was virtually a mere adulteration, injuring the quality of the cement, and useful merely as a means of defrauding customers, under color of a theoretical similarity in chemical composition between the cement and slag, which might be quoted with good effect by a plausible salesman; and a few years ago a convention of German cement manufacturers denounced the addition of slag as dishonest and useless. Now, however, by persevering effort, the art of making good cement from slag has been greatly developed, and it seems quite probable that the next decade will see the completion of two great industrial achievements, the production of a cheap and excellent cement from materials almost everywhere available, and the profitable utilization of one of the most cumbersome waste-products known to the arts. The extent of the resources which the manufacturers of the new cement have to draw upon may be judged from the fact that, in addition to the mountains of iron slag which already cover the smelting districts of Great Britain, the English furnaces now in blast furnish nine million tons of fresh slag every year, while those of the United States are not far behind their British rivals, and the French and German furnaces turn out nearly as much more. As a barrel of cement weighs on an average about four hundred pounds, the annual British product of slag alone, if it could all be utilized, would afford forty-five million barrels of cement — enough, if made into concrete, to build a dike fifty feet wide, and a hundred feet high, across the English Channel.

WITHIN certain limits, the chemical composition of iron slag is nearly the same as that of cement, both being composed of lime and clay, with a little magnesia and alkali. An important difference, however, consists in the relative proportions of lime and clay, the foreign Portland, like our Rosendale cements, containing about two-thirds lime to one-third clay, while the iron slag varies from equal parts of clay and lime, in that from hematite ore, to one-third lime to nearly two-thirds clay, in the Cleveland ores. As it is well understood that cement, either natural or artificial, containing more than one part clay to two parts of lime is inert, and incapable of setting, either in water or in air, the solution of the problem of making slags into good cement must obviously lie in the direction of adding lime to it in sufficient quantity to give the proper proportion between the two principal ingredients. The history of the manufacture of Portland cement has already shown that in order to do this efficiently an extremely thorough grinding and mixing is necessary; and the successful modern processes for the manufacture of slag cement secure this in various ways. The process now in most extensive operation appears to be that invented by Messrs. Bosse & Walters, of Brunswick, in which the slag, hot from the furnace, is run directly into cold water. This has the effect of granulating it; and after cooling, and drying thoroughly, the mass is coarsely ground and sifted. Meanwhile one part of lime to every three parts of slag has been slaked, by immersion in water, dried, and separated by a fan from the heavy and unburnt particles which may have been contained in it. The proper quantities of sifted slag and lime powder are then introduced into a corrugated cylinder, together with a number of small cannon-balls, an inch or more in diameter. After turning slowly for two hours, the cylinder is found to be filled with a very intimate admixture of the slag and lime, in powder so fine that most of it will pass through a sieve containing forty thousand meshes to the square inch. This is the slag cement, ready for use. In rapidity of setting, the new cement resembles our Rosendales more than the Portlands, the time to the first induration varying from two to eight hours, while Portland cement often sets in half-an-hour. In use, the slag cement resists the action of water better than Portland, and it is entirely free from disposition to swell in setting. In tensile strength the Portland cement is superior for the first month or so after setting, but the slag cement then begins to gain; and a few months later the strength of the slag cement, either pure or mixed with sand, is in some cases nearly double that of Portland cement. In other respects, the two sorts of cement closely resemble each other, so that the slag compound seems quite as desirable for use as the rather uncertain Portland, while the price is much less, mortar made with three parts sand costing now only two-thirds as much with slag cement as with Portland, while the manufacturers assert that with a little more experience the slag cement can be made and sold at a profit for ten shillings a ton, or less than fifty cents a barrel. This is little more than one-half the price of our native Rosendale cements; and if the iron furnaces of Pennsylvania, Ohio, Tennessee and Alabama could produce a first-rate article, at anything like the same price, they ought to find the profits of their business materially increased, while the people of the country would be benefited by having one of the best and most useful of building materials put within reach of the slenderest purse.

THE Italian army which has recently completed its rather innocuous campaign in Abyssinia was equipped with military balloons, managed by parties properly drilled for the service. The only difficulty about using this very modern weapon in the African wilderness was, very naturally, the inconvenience of carrying with the expeditionary troops the apparatus and materials necessary for producing gas for inflating the balloons; and, according to the *Revue Industrielle*, the Italian military engineers solved the problem by carrying with them a supply of hydrogen gas, compressed into steel tubes. The gas was made at the arsenal in Naples, by treating iron with sulphuric acid and water condensed by machinery, and forced into cylinders five inches in diameter, and four and one-half feet long, made of steel about three-sixteenths of an inch in thickness. The pressure in the cylinders is enormous, amounting to nearly a ton to the square inch, but the gas is rendered in this way very portable, and forty cylinders, which a strong horse could easily pull in a cart, or which twenty men could carry on their shoulders, contain gas enough to inflate one of the balloons employed.

LA SEMAINE DES CONSTRUCTEURS contains some sarcasms at the expense of the statisticians of the Canton of Zurich in Switzerland, who in their efforts to classify acceptably their fellow-citizens, have, apparently, found it necessary to dignify most of them with the title of "artists." Thus, under the general head of "Artists" in the official schedule of occupations, are to be found, not only painters and sculptors, but dentists, chiropodists, riding-masters, dancing-teachers, acrobats and proprietors of learned dogs and two-headed calves, besides representations of other branches of art. One of the Swiss papers gravely asserts that a discussion arose among the statisticians of Zurich, whether umbrella-makers should be classed as artists or not, but, on being put to vote, the question was decided in the negative. It is a pity that the officials should not have studied the American customs in these matters. With our "art" furniture, "art" cooking-stoves and "art" manufactures in general, there would certainly be some way of including the umbrella-makers, and, indeed it is difficult to see who could be left out of the roll of artists, except, perhaps, the lawyers and doctors, who have yet, we believe, to introduce "art" briefs and prescriptions.

AN earnest appeal has just been made in the Vienna technical journals for the formation of an Austrian Association of Engineers and Architects. In Germany architects and engineers are educated together up to a certain point, and the two professions are generally associated in the local societies, so that a national association of the same kind is likely to be of greater benefit to each component portion than two separate bodies would be. The Provisional Committee which issues the call describes the objects to be obtained by the formation of the new society as the establishment of insurance and pension funds, the defence of professional interests and rights, the suppression of abuses in professional practice, the regulation of competitions, and several minor matters, among these being the formation of a technical library for the use of members. The Austrian territory, in its lack of great centres of population, is less like Germany, where every little state has its capital, than it is to our own country, and our new professional association, in the important task which should come before it, of making itself useful to the isolated members practising in small towns as well as to those who live in New York, Boston, Philadelphia or Chicago, may learn something from the experience of the Austrian society.

THE DECORATIVE USE OF COLOR.[1]

From the Rathhaus, Halberstadt. From Arkitektonische Rundschau.

THE title of this paper is intended to indicate the limits which I propose to myself in dealing to-night with a subject which admits of consideration from several points of view, and covers a very wide field. Of the scientific side of colors I propose to say little or nothing, and of that side of the subject which relates to the pictorial use of color I am also desirous of saying no more than is incidental to my own branch of the subject. My wish is to draw your attention to those principles which should, in my opinion, regulate and underlie all purely decorative work, when applied to forms and surfaces which, whether they appertain to buildings or to movable objects, made by the hand of man, are not presentations of natural objects.

Unlike the works of Nature, the things which man invents and constructs for his own use have their design based upon simple geometrical forms, and, in the majority of instances, these are in some direction symmetrical.

In all parts of a building and in a vast number of other products of man's invention, stability is the first requirement, and precisely in the degree to which this condition is important to the structure is it important also that any color, used decoratively on that structure, should assist and confirm the idea of stability or of strength.

In considering the lessons to be derived from Nature in the matter of decorative coloring, we must never lose sight of the great distinction between the forms to be colored. In the case of Nature we may almost say that the forms to which beautiful coloring has been applied are never simple geometrical forms and rarely have stability as a characteristic. Nature is always moving, always presupposes motion. Animals, birds, insects, foliage, flowers, these are the objects on which her most exquisite harmonies are lavished. All move, either actively of their own volition, or passively, by the action of wind or wave. If, therefore, we may seek in them instruction in the combination of harmonious colors, as we undoubtedly may, we must not look to them for instruction in the distribution and arrangement of color upon objects and structures which are intended to be immovable. We can follow them in coloring a fan, not in coloring a dome.

I lay stress on this distinction at starting, because I strongly advocate constant recourse to Nature, and to reap advantage from her teaching, you must beware against misapplying it. Moreover, the true lessons to be derived from natural objects are not to be fully learned from those objects detached from their natural accessories or surroundings. Something may be so learned, yet it is but a fraction of the whole, a word or two out of the poem.

We may certainly go pretty directly to Nature for lessons in one form of decorative art — I mean the art of dress — so far as the distribution and harmony of color are concerned. I do not know to what extent the fashionable dressmakers make it a practice to study the combinations of color in flowers, birds and other living things, but I am quite sure that they can go to no better school, and I feel pretty sure that the most artistic designers of women's attire draw their best inspirations from these sources. After making the necessary allowance for complexion and other special circumstances, there is considerable resemblance in the conditions which would regulate the arrangement of color in a lady's dress to those which are found in the plumage of birds. There are the same easy curves, the same variety of attitude, which render geometrical or very regular and symmetrical division unsuitable, and which, on the contrary, invite irregular forms, with the occasional piquancy of a suddenly accentuated contrast. In graceful movement or in graceful repose there is no symmetrical arrangement of the limbs nor of the curves of the human body, nor, indeed, in animal form of any kind. Hence, those surface divisions of color are best which are independent of any one attitude, which, in fact, are not liable to distortion by each change of position.

But how different is every condition when we come to deal with a solid and inanimate structure. It is difficult to follow the rapid and, to a great extent, unconscious workings of the mind in matters of taste and in the exercise of the critical faculties, difficult to distinguish what is due to discrimination and what to association with some previous experiences. But there is one circumstance indispensable to the enjoyment of the beauty of any work of art. It is this: The mind must have no doubt, no misgiving, as to the object's stability; to that extent the mind must be satisfied at a glance. That amount of repose attained, it will (unconsciously) seek knowledge of the general form and outline, and only after that will it settle into such a reposeful condition as to allow of the examination and enjoyment of detail. So long as any perplexity remains, the sense of duty will be dormant, or nearly so, where the handiwork of man is concerned. Man must understand his brother man's work, or it troubles him. Now, it is just at this point that color comes in with a few words of rapid explanation — if properly used. Color will explain form at first sight (if used to that end), with a clearness and rapidity quite unattainable by form alone, and especially by form alone in a diffused light.

The reason why the exterior of a building is comparatively independent of color for the expression of its proportion and of its structural lines is that the stronger and more direct effects of light at once throw into relief the salient features. It is the reduced and diffused light of the interior which renders the explanatory help of color so valuable, I was going to say indispensable. True, color serves other and less simple ends, but that is its first purpose, and to so use it as to explain simply and effectively the structure and proportion of the interior, and the direction and nature of its surfaces, whether plane or curved, convex or concave, is the first duty of the architectural colorist.

Be the ultimate object the richest splendor, the most elegant elaboration, or the most austere simplicity, the first consideration in the use of color to any interior, or to any part of a building, must be that it shall assist and in no way confuse that sense of repose which comes of a prompt recognition of its main forms and structural lines.

Now, before proceeding to consider by what methods this object may be accomplished, I will here just anticipate a comment which will no doubt have occurred to many of you on this postulate. "This may be true," you say, "of such buildings as have architectural expression and structural features to deal with, but what of the numberless interiors and structures which have no such features and no such expression?"

To this I reply that, so far as the want of such expression is perceptible, the colorist's first aim in treating such structures must be to offer such a substitute as will afford the same mental repose. In other words, he will so distribute his color that the forms brought into prominence may assist the idea of stability and go to counteract any sense of apparent weakness or confusion.

It is, however, more convenient to deal first with that part of the subject which relates to buildings having defined structural expression. Now such buildings vary immensely in the extent to which they may be said to rely on their architectural detail for effect, or to be dependent on color. Broadly speaking, one may say, "the more moulded surface the less color," and the greater the necessity for extreme care in its use. In an interior which is already elaborately treated by the architect with mouldings and carving and the surfaces subdivided into panels, simple "explanation" must be the aim. To distinguish the really important structural features from the mere subdivision of intermediate space, and to do this without detaching them, is the first object. There must be the same sort of relation between the major and minor structural lines that there is between the trunk and its branches.

Take the case of a vaulted hall or church, with arches and vaulting springing from piers or columns. A relationship must be maintained (whatever the extent or scale of color), not only between piers, architraves, cornices and archivolts, but between these and such minor divisional features as subdivide the surfaces between them. Subdued in tone these last may be, but not removed nor sharply contrasted. The broad contrasts must be between the structural forms generally and the spaces or surfaces between them, whilst the sharper, more vigorous relief of color must be within the limits of and expressing the direction of the structural features themselves.

But, again, there are many buildings which, having the same main constructive features as that which we have been considering, have no such minor or secondary moulded divisions. Each bay of the vaulted roof may be a blank surface. We have then to consider what alternatives may be adopted in treating these blank spaces.

First. It may be contemplated to devote them to a decorative

[1] A paper by Mr. John D. Crace, read before the Society of Arts, and published in the *Journal* of the Society.

pictorial treatment, without actual subdivision. This will rarely be quite satisfactory; because any pictorial representation, straying, as it were, over a large area of curved surface, produces some confusion as to the form of the surface, and what is architecturally more important, leaves the structural lines too detached from what they should support — standing in fact like the bare bones of the whole. In such a case, however, this ill effect may be much moderated by interposing, between structure and panel, a band or bordering of such coloring as will, while supporting and spreading out the constructive arch or rib, allie it in some measure with the coloring of the panel.

But, however excellent may be the pictorial work, it will be seen to far more advantage if it be framed and supported by such dividing margins as will serve at once to suggest the contour of the surface, and to limit each pictorial area to such space and form, as can well be seen from one point of view. It is not necessary that these minor dividing bands should represent actual or possible structure. It is sufficient that the major lines of construction are expressed, and that the contour or section of the spaces between is explained by lines which become the equivalent of the minor construction — and suggest the ramification or network of support.

There is yet another type of internal structure, which may be founded upon the same general lines as those we have just considered, but is divested almost entirely of mouldings, or moulded relief. Such buildings are dependent for their effect entirely on their colored decoration, and are, perhaps, so built with the express object of affording scope for such treatment. Firmly expressed lines, and borders of color, take the place of mouldings; and these must have sufficient force to make clear the structure, and to define the limits of the several areas of surface.

It is upon interiors of this last type that mosaic decoration may be most advantageously employed. This magnificent method of decoration by color does not accord well with the use of mouldings, except to the most limited extent. Its nature demands exceptionally bold treatment, and the very strength and brilliance of its effects destroy all perception of the delicate shadows and roundings of good mouldings. It demands large surfaces, and is most effective where the surfaces are curved, these affording that variety of angle to the light which gives such splendor of effect to the gold grounds. It is under such conditions that mosaic is used in St. Mark's, at Venice; in the churches at Ravenna; and in many other of the best examples.

In the course of the foregoing remarks I have repeatedly spoken of the need of lines or division margins to "explain" the contours or planes of large surfaces. It is perhaps necessary to show why they are required, and how they serve the purpose.

It will be obvious to any one who considers the matter that it is only by *its external limits*, or by some indication of shadow or other incident, that we feel at all sure whether any large surface of one tint is perfectly flat, uneven or curved. We can see that a plastered wall is bulged if we look at it edgeways against the sky or against some vertical line; but if we stand facing it, and the light be diffused (that is to say, if there be no cast shadow), we can form no true opinion as to whether the wall is a true plane, or bulged and out of upright. But if, instead of being plastered, it be a brick or stone wall, with straight horizontal courses, every joint of which is above or below the sight-line will at once betray the curve of the bulge, and will indicate whether it be convex or concave. These horizontal joints will not, however, tell us whether the wall leans bodily in or out, or is "hollow" from top to bottom; we must look for some continuous vertical joint, or to some door or window opening, to betray this. We must, in fact, have the means of comparison, which a straight line, or a line of known direction, will afford.

Now let us see how this applies in decoration. We will take a feature over the treatment of which there has been much discussion during the last few years — the "cupola" or interior of the dome. Suppose that we are standing under and looking up into a plain undecorated cupola, what do we know at a glance as to its form? What remains in doubt?

Well, we know, at once, that it is circular in plan; we learn that from the cornice, from which it springs; but beyond that, and some chance indication that its vertical section is curved we know nothing. Whether that vertical curve is high or low, elliptical, semi-circular, or segmental we do not know, and cannot so much as guess, until, by dropping a series of vertical lines on its surface, we exhibit its vertical section. Then doubt disappears, and the eye, relieved from perplexity, and satisfied as to the stability of the vault, soars up the curved line, grasping the whole meaning of the noble form, and ranges tranquilly among such detail as may occupy its surface.

Now, as the cupola is explained by these vertical lines, so is a barrel vault explained by the archivolts which divide it into bays, and by the other framing lines between them, whether they be in color or in relief only. So groined vaulting is explained by its ribs; and where the builder has already provided such explanation, the decorator must confirm it; where it does not exist, he must supply it.

Let us now consider what is to guide the colorist in dealing with interiors which have no structural features to emphasize; which in fact, cannot be regarded as architecture at all. If such be of a size and for a use, which seem to call for some attempt at imparting dignity to its effect, it will probably be desirable to suggest, by the decoration, some structural division. In some cases the addition of a frieze will establish more agreeable relations between the walls and ceiling; in others some vertical division of the walls — which may form points of departure for division of the ceiling — may greatly enhance the dignity, and improve the proportion of a plain room. In any case, if there be any strength of color in the ceiling, there should be, at some points, strength of color leading up to it. In rooms for domestic use these are often practically supplied by the window hangings, and in the majority of such rooms the dimensions are so limited that the want of constructive features is not felt.

And it may here be remarked that one very broad distinction divides most domestic interiors from those which are intended for some public or special use, when the question of colored decoration arises. In the latter there are no draperies, nor carpets, nor any of those accessories, such as furniture, which all play so important a part in the coloring of a private house. Consequently, in the absence of these, the decorative coloring of the building itself has to be more complete, its harmony more carefully balanced, more thought out as to the purpose and result of each tone used. The absence of the accessories of a house, with all their variety and irregularity, leaves the coloring of the building more exposed to view and more directly challenging criticism. A firmer, surer, and more purposeful hand is needed for the coloring of a bare public building than will serve for the domestic interior, in which picturesque arrangement, suggestions of historical association or foreign travel, or the collector's taste, may often play a more important part than either architecture or decorative color. Nevertheless, much may be done, even in a room of moderate size, to improve or make the best of its proportions, and to impart an interest to it, as a whole, by the distribution and management of the color. The flat ceiling which, being the largest unbroken surface in the room, always has a tendency to appear weak, may be lifted and supported by the lines or grounds of color which form the framework of its ornamentation, being so arranged as to throw strength into the sides and angles; and these leading forms and lines may themselves be made interesting and suggestive by their combinations of curve or angle. It is a common error to suppose that color will "bring down" a ceiling. This will only happen where the tones are too strong or too crude for those which occur on the walls and in the draperies. All ornament must be kept subordinate in strength of contrast to the tones of the framework or controlling lines. If this be neglected, a sense of confusion will mar the effect, and destroy the repose essential to success.

The use of polychromy for external decoration demands very careful attention; and the extent to which it is desirable, as well as the best methods for its exercise, have been much debated during the last thirty years.

I would venture to say on this subject, that, in a building which has any pretence to architectural design, the polychromy of its structural features should be confined to that presented by its constructive materials. Yet even such buildings present occasionally features or surfaces which may be so treated in color (whether by mosaic, or even by the painter), as greatly to enhance the effect and value of the whole. I could point to numerous examples, both ancient and modern, of the successful use of color in this way. Of modern instances, I may quote the great frescos outside the Berlin Museum, where color is used pictorially; or the merely ornamental coloring of the window reveals in the Chateau de Blois; or, again, the very skilful introduction of mosaic ornament in the brickwork of the Trocadèro at Paris, all of which must, I think, be admitted to contribute largely to the effect and value of the buildings themselves.

But there is another class of building, of which we have only too many examples here, which afford occasional opportunity for some amount of color treatment. I mean the stucco-fronted houses, in which design can hardly be said to have a place. Their "architectural symptoms" are of the slightest, and they, in any case, have to be painted in some way, periodically, to preserve them from decay. Here there would seem to be a fair field for careful schemes of color, and I have observed a few very able instances of the external treatment of such buildings. Certainly, there is a growing taste for some application of color to such houses, even where they are private residences. One such residence near me has recently had its ground story (including the front door and area railings) painted the color of red sealing-wax. After this, I feel that it is not timidity that restrains us in this matter. What we seem to want is judgment — a knowledge of how to compensate, by simple means, for the want of beauty and interest in the structural form.

There is, again, the detached villa, which, being less prominently exposed to public view, might often be made a much more attractive and more refined looking building, and be brought into better harmony with its small pleasure garden by a little skilful coloring than it is when its stucco surface is left with the usual two coats of "light stone color." Many a small suburban house in the outskirts of Paris has so been treated, with the result of presenting as much outward charm as if many hundred pounds had been lavished on architectural refinement.

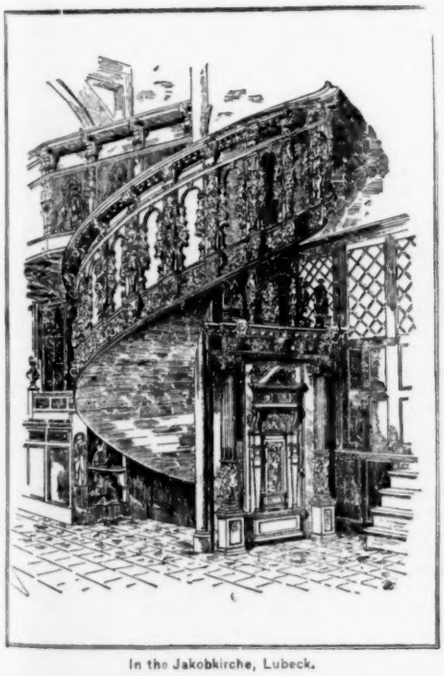
True, it is not so permanent; but is our lease-hold tenure so permanent as to offer much inducement to us to spend money on permanent adornment? The great majority of us think ourselves lucky if our interest in the house we live in extends to 20 or 30 years; at the end of which time our ground landlord swoops down on us with a bill of dilapidations, with an extra rent-charge, and probably a demand for premium based on our own improvements. It is quite a question whether the house will last another such term; for it must be admitted that, however charming, your stucco villa is not a very long-lived piece of work. Not that I join in the abuse of stucco, for

under the short-lease system you probably get a better and more weather-tight house for your money, if it be of the modest "stuccoed" order, than if you attempt one, at the same rent, in sculptured free-stone or ornamental brick. Only it is better to treat it as stucco, and to do your best with the paint-pot, than to make believe it has a noble stone frontage.

The same general rules which should regulate the distribution of colored form on parts of a building apply, with reasonable modifications, to smaller objects. Take pottery: if a vase or cup has a graceful contour, it is obviously desirable that any variety of color used in its decoration should assist in showing its form, not disguise it. Very beautiful art is often expended on such articles with the result of actually detracting from their beauty of outline. I am not speaking of modern English pottery in particular. It is a mistake common enough in the finest manufacture of other countries, and it seems to me a quite unnecessary mistake. Of course, very exquisite painting will charm, even when used to poor advantage, but its merit of execution does not altogether justify its misapplication. In our own time and in our country, it is a great misfortune that all our best artists learn to paint for a gilt frame alone, and are, for the most part, absolutely untrained in thinking out their subjects for any other application. I cannot but think that in this matter our Royal Academy of Arts might effect much reform, and give an impetus to the artistic excellence of the productions of this country, if, from time to time, they admitted to their exhibitions some proportion of objects of applied art of a high standard. It would encourage the best men to throw some, at least, of their best work into branches of art that can never rise to the highest level unless they draw to their service the best men. It was these branches of art that went to build up the fame of the greatest artists that the world has known; and I confess to the opinion that, so long as our highest art training has no other object than the production of detached pictures, destined to no special purpose or position, painted to no requirement, having for object chiefly to catch the eye of the buyer, so long the standard of art will drift right or left, to this or that particular fashion of excellence; but, being without purpose, will never attain to any very noble rank.

I am afraid that my discourse to-night may provoke the criticism that, being "on the use of color," it has mentioned no single color, has suggested no harmonies, has indicated no contrasts. I must plead that these omissions were intentional, not because I think these things in themselves less important than the matter I have spoken of, but that they are now frequently and ably treated, and are daily better understood. I was desirous so to limit my subject as not to divert attention from my main proposition, which is, that whatever the tones of color employed, whatever the scale of harmony, no "decorative use of color" can be really successful which is not based on the intention to do the best possible for the thing decorated. And then I go a little farther, and say that no art can really attain the highest excellence if it has no broad purpose, no alliance with its sister arts. The art which is shut up in itself, whose masters have neither trained knowledge of, nor sympathy for, its allies, whether humble or noble, can never be progressive. In art, as in life, man's noblest work is most often produced in the earnest effort to ennoble and complete the work of others.

COLOR OF FURNITURE.



In the Jakobkirche, Lubeck.

OUR engrossment with art is more general than was the case with the men of the Renaissance whom we copy. Where there was then an active corps of patrons and artists, a world of producers and consumers now engage in the work of resuscitation, so that an account of the present movement will make a page of popular histories and not alone of biography or the development of art. It is to be wondered at, since this is the case, that the movement has kept so wholly within, or rather along practical historic lines. The large element of laymanism in it would seem to justify the expectation among other things of phantasy — I do not mean of productive fancy, but of contemplative observation. The literature of the period shows the Cinque Cento and the sixteenth century as having it. Along with the text-books of Alberti, Palladio and du Cerceau existed Simon Portius's and innumerable *de mirabili potestate artis*.

Perhaps we shall come to it. Coming a short way towards it would not, I think, be undesirable. After accepting the material, imitating and emulating the designs of the past to fulness, we may brood over the inner spirit of our surroundings as the past brooded on hers. The step is near and natural. Taste in the first degree is refinement of sensations, but we have taste often in the second and third degrees, or as habit of sensation. Phantasy may be useful here in making out of routine a way into new alertness of perception.

Take the color of our rooms as an instance. What have we thought upon this subject beyond the fact that subdued tones are agreeable? That they are suitable to our climate, which furnishes enough light to enliven them, and are of especial benefaction to the nervous American race by reason of their quieting influence? Such reflection is already speculative, but there are further steps in speculation that bring us beyond general theories to attentive reflection upon the color and tone of our houses as a whole and of each room in particular. No less an authority than Goethe has touched the subject (Goethe, to be sure, does not bring forward the matter as speculation, but calls it experience). "Experience," he remarks in *Zur Farbenlehre*, "teaches that each color incites its own peculiar mode of feeling. It is told of a clever Frenchman that he maintained the tone of conversation at Mme. —— had changed since she had changed to crimson the color of the furniture in her cabinet that had been blue. Among colors, yellow embodies light when in its clearest purity, and possesses a cheerful, charming, encouraging and gentle property. It is agreeable as a surrounding, whether as dress, drapery or carpets. Gold gives a new and exalted idea of the color, especially when it is polished. A brilliant yellow against shimmering silk or satin produces a peculiarly noble and splendid effect."

It did not lie in Goethe's line of reflection, else he might have added that we find an historical proof of these definitions. For at the period when society reached in France a height of social refinement such as it never attained elsewhere, not even in Italy, by reason of the inferior influence of the womanly element in Southern society, the color used for ante-rooms and salons of reception was almost invariably yellow — yellow in pure shades or enlivened into amber. "All that has been said of yellow," our author continues, "is true of reddish yellow, only in an increased degree. Reddish yellow incites a feeling of warmth and blissfulness. Red transfused with yellow, on the other hand, has something powerful and raw. It is no wonder that energetic, healthy, rough people like it. That savages have a preference for it has been often noticed, and children, if left to themselves with a box of paints, are not economical in the use of red lead and cinnabar. One needs only to stare at a spot of perfect yellowish red to find that it bores, as it were, into the optic nerve. It excites an almost incredible effect. Animals are made uneasy and almost maddened by yellowish-red cloths, and I have known persons who could scarcely control themselves if, on an overcast day, a man came in sight with a scarlet jacket on."

This color is banished from our houses. The only reminder of its primitive use as an excitant is found as curtains at bar-rooms. If refined Orientals still continue its use, as is the case in Constantinople, we have to reflect that the intensity of Eastern sunlight casts a glow and reflection on all surrounding colors, materially modifying its single effect.

Goethe found blue to have something dark in it of an indescribable influence. We like to look at blue as we like looking at a distant landscape that seems ever to withdraw as we approach, not because blue intrudes upon our sight, but because it draws us after itself. Blue conveys the same feeling of coolness that a shadow does. Rooms that are papered in blue appear comparatively spacious, but rather empty and cold. There is an appropriateness in this color for such society rooms where the toilettes, the rosy hues of flesh, sparkles of eyes and flashes of teeth, jewels and gaslights are to be raised; for bed-rooms in summer cottages; for garden-houses where respite from society and from heat are sought.

"Red conveys an impression of earnestness and dignity, as well as of condescension and grace," it is remarked further, "the first-mentioned effects being produced by its sobered, darkened hues, and the last by its light masses. History has much to say of the jealousy of monarchs over purple. Surroundings of this color are always dignified and magnificent." Red is proper for entrances to palaces and for apartments of state, and, in conjunction with other colors, for parlors.

The implication of the Parisian wit was to the effect that whereas conversation at Mme. —— had been reserved, it became warm; indeed, as the change of color of the room was to crimson, he probably even meant *distastefully* warm, a French prejudice existing against this shade of red as a typically repulsive degree.[1]

Green is peculiarly quieting and gratifying to the eye. Goethe found a tendency among his countrymen to choose this color for sitting-rooms. It is perhaps the best tone for the sleeping-chambers of the old as rose-color is for those of the young. As a matter of fact, our rooms are mostly of mixed colors, but a tone, nevertheless,

[1] The French say for excessively homely, *laid en cramoisi;* for besotten silliness, *sot en cramoisi;* for villianous, *méchant en cramoisi*, etc.

prevails, which might be tested with advantage, perhaps, according to these ideas.

THE ILLUSTRATIONS

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

VIEW OF THE NEW PUBLIC LIBRARY, BOSTON, MASS. MESSRS. McKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print issued only with Gelatine and Imperial editions.]

PLANS, SECTION, INTERIOR COURT-YARD AND INTERIOR OF READING-ROOM OF THE NEW PUBLIC LIBRARY, BOSTON, MASS. MESSRS. McKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

THE site upon which this building will stand lies in Copley Square in the Back Bay district. The material selected for the building is Milford granite, the color of which is warm and attractive.

Flanking the central arched doorway are carved granite seats, with groups of sculpture on the two sides representing the Arts and Sciences, and with single figures at the threshold representing Philosophy and History. When the visitor enters by this doorway he will find himself first in a spacious vestibule of stone, 55 feet long and 16 wide, and then in a grand entrance-hall of marble, 37 by 44 feet in size. The main staircase, which leads upward from the first floor (a floor given up to the uses of the working departments of the library) is to be of the finest Sicilian marble, the steps being 20 feet long. On the second floor is found the reading-room, which takes up the entire frontage, its size being 42 feet by 218, with a height of 50 feet, and a barrel-vault roof. The woodwork of this magnificent apartment is to be of oak, wainscotted from the oak floor to the base of the great arched windows, a distance of 14 feet, while at the two ends of the long room are small arched spaces cut off from the main room by means of carved oak screens. For the storage of the vast collection of books space is found in that side of the building that lies parallel with the front and in one-half of each of the two remaining sides. The entire space in these parts of the building, from the ground-floor upward, is given up to the shelves, which are arranged in six stories, each 7½ feet high.

It is estimated that the new building when finished will have cost $1,175,000, and that it will require at least three years to finish it.

THE ROYAL ACADEMY, LONDON.

Church near Meiningen. From Arkitektonische Rundschau.

THE Academicians may be congratulated upon one reform which they have carried out in this year's exhibition, the practical limiting of most artists to one picture. Many years ago I suggested to the late Tom Taylor that this ought to be done here in London, and that if men like Meissonier and Gérôme could gain their reputation by exhibiting only two pictures at the *Salon*, we in England ought to be able to do the same, and consequently that our governing bodies should adopt this practice. Mr. Taylor made the suggestion public in the *Times*, *apropos*, I think, of the Dudley Gallery; at all events the Dudley of those days was the first to set the fashion. The Academy has never formally made any rule of this kind, but it has this year acted upon it indirectly, for out of 1,350 exhibitors, only half can have more than one picture hung, and as a few Academicians and others still sin by exhibiting four, five and even six and seven, many more than half the 1,350 artists can only have one work upon the walls. Mr. Herkomer has seven portraits, but Mr. Herkomer is a prolific producer. Not only has he painted well nigh a dozen life-size portraits, but he has composed a romantic musical fragment, the "Sorcerers"; he has done a number of sketches around his Bushey home, and has superintended his school, stage-managed his "fragment," lectured and acted. This would seem for most men to be enough for several years' work, but Mr. Herkomer is industrious and does not let the grass grow under his feet. Still, being human, perhaps it would be wiser were he to do less, or rather, attempt fewer things, for certainly his portraits are not nearly so good this year as they were two years ago. There is a want of care which comes of attempting too much, and some of his work might, without irreverence, be called slovenly.

Mr. W. B. Richmond's "Prince von Bismarck" is a *tour de force* if it be true that the chancellor only sat once for the picture, but it is an unpleasant portrait of a repulsive individual. Far more agreeable and infinitely better painted is "Viscountess Hood" by the same artist, a noble portrait, and were it not so thoroughly a reproduction of Sir Joshua's "Mrs. Siddons as the Tragic Muse," it would be still more commendable. It is a pity Mr. Richmond does not depend upon himself for his composition; last year Lord Pembroke appeared as an echo of Murello; this year we have the shadow of a Reynolds; who will be the next?

Mr. Yeend King has three charming landscapes of sunny effects of trees and water, and Mr. Henry Moore's "Nearing the Needles" is an exquisite study of a stormy sea after a gale, when the coast is lighted up by sunshine, while the water remains angry and dark. Mr. Arthur Hacker has a very good portrait, but perhaps the best in the exhibition is M. Carolus-Duran's of Professor Pasteur. Full of vigorous but subtle painting, this head stands out amongst an unusual number of good portraits. When M. Carolus-Duran is at his best, who is equal to him? and if the lady's portrait, the "Countess of Rico," is not one of his best, it is not the painter's fault, for the only natural part of the picture, the red velvet dress, is superbly treated. A woman who paints and powders herself cannot expect a painter to give her a complexion.

M. Gérôme's "Barde noir" is hard and lifeless, although the accessories are well painted, but M. Gérôme's style is quite out of date, and we turn to Mr. Henry Woods' work with pleasure. This painter's "Saluting the Cardinal" is a brilliant piece of coloring, and one or two other corners of Venice, where Mr. Woods lives, are equally crisp and sunny. Mr. Frank Holl may be said to be as usual; many masculine portraits, masculine both as regards the sex of the sitter and the character of the work. So, too, Sir Frederick Leighton's "Captive Andromache" is as usual, refined, well-composed and ideal; it cannot fail to be attractive, but it is purely decorative in treatment and the painting is waxy and somewhat crude in color. Still, the president is the only English painter who ever attacks such subjects with any sort of success.

Mr. F. Goodall has lately gone in for religious painting and he and Mr. Herbert divide the honors between them. Both occupy a considerable amount of wall-space, which might be better filled by more modest productions; indeed, so thoroughly unreligious is its tone that indeed were one to look for long at Mr. Goodall's "Sea of Galilee," I fear the result would be vigorous agnosticism.

Mr. Orchardson is always great in execution, however commonplace his subjects may be, and could I take upon me any painter's mantle, I think it would be his. "Her Mother's Voice" is charming as a whole, although the girl is anything but pretty. But the attitude of the father thoughtfully listening to his daughter, and the young man standing by the piano are excellent studies. How many painters besides Mr. Orchardson could bring out that young fellow's face against the light wall? If this picture is well put together, no one will charge Mr. Alma-Tadema with paying too much attention to composition. Bit by bit, what splendid painting it is, and what masterly drawing! How could Mr. Tadema do anything, which, as *technique* is not perfection? But as a whole, the picture, "The Roses of Heliogabalus" is very unsatisfactory; it is confused and wanting in repose. Sir John Millais's "Murtly Moss," perhaps, sins in the opposite direction; equally wanting in effective treatment, it is too reposeful, having no leading point; it is, as it were, a bit of country cut out of a panorama. A monotonous sky, a weak distance and a monotonous foreground.

One of the most pathetic pictures in the galleries is Mr. Frank Bramley's "Hopeless Dawn," a poor attic, an old woman, a girl laying her head in her mother's lap, a sputtering candle, dawn breaking through the window, showing a rough sea beyond — such are the elements composing a picture to which are attached some words of Mr. Ruskin's: "Human effort and sorrow going on perpetually from age to age, waves rolling forever, and winds moaning and faithful hearts wasting and sickening forever, and brave lives dashed away about the rattling, beach-like weeds forever." Such is the lot of the mass of struggling human beings who cumber this earth.

Mr. John Sargent has sent a first-rate portrait, Mrs. Henry Marquand, and M. Albert Aubert is welcome in London. His "Turc en prière" is very vigorous. Mr. Long's large work is remarkable. It represents the Egyptian custom of "Judging the Dead." Which are the more wooden and mummy-like, the twenty-four assessors or the mummy-case, it is hard to judge, but as Mr.

Long occupies half the wall-space on one side of a room, and his description of this strange practice fills three-fourths of one page of the catalogue, we presume the picture is worthy of much attention. All the same it seems a pity it should not have been shown by itself or with other works of the painter in Bond Street or elsewhere.

Mr. Waterhouse's "Lady of Shalott" is not equal to his "Marianne" of last year, but that does not mean that it is not very superior to an immense amount of work on these walls.

Miss Helen Cridland's "I have a friend, a kinder friend has no man," a waif hugging a mongrel cur, is pathetic. Equally touching is the sadness of a group of cabs and horses standing in snowy, London slush, "Les Misérables" by Mr. Dollman. Mr. Phil Morris ought to go to school again, and Mr. Frank Topham ought never to have left it; let both these gentlemen look at Mr. S. Solomon's "Niobe" and learn how to draw, paint and compose. Really, some of Mr. Morris's work is beneath contempt, but probably his pictures will be eagerly snatched up by the illustrated papers for Christmas numbers. It is impossible to note all the small pictures I have marked and it would not interest readers who will not have the opportunity of seeing them, but there seem to be more than usual this year which are first-rate. Many are the good water-colors, but space compels me to omit mentioning any names.

On the whole, it is one of the best exhibitions I remember at Burlington House, but the English school is dead. All the younger men are French in style, if not Paris taught. For purely English work, I imagine, we shall be obliged this year to journey to the new gallery in Regent St. Formerly, in good work or bad, the style, or rather, the want of style, was the same — young and old all painted alike. Now one sees the old manner represented by the older Academicians and the new style illustrated by the younger generation, that is to say, the Paris schools. Many of these pictures would be quite at home on the walls of the *Salon*. Could we have invented a school (other than that of Mr. Burne-Jones, which is unique, but not all-sufficient), it would have been better, but if we could not learn to paint or to draw, if we could not acquire a style of our own, it is well we have gone to France. The Burne-Jones school is charming in its way, but we want something else, some other style, and this we now have though French in character. Perhaps we may engraft it onto our own insularity — *I* have no desire to retain the latter — and assimilate it, and so form a new style, but in any case I think there is no fear now, as I thought a few years ago, of your painters outdoing ours in the future. Americans saw the wisdom of going to the best school years ago; we English are slower and less ready to seize a new truth. But we are all now in the same boat, and as art is cosmopolitan, let us only be rivals in a friendly spirit, or rather, let there be no rivalry but that of a strong desire to excel. It matters not at all what the nationality or sex of a painter may be, since art is of no country and no sex. PENGUIN.

HORRORS OF THE BOYCOTT. — We commend the following extract from the London *Telegraph* to those Americans who entertain a mawkish sympathy for the Irish in their struggle against the landlords: —

"If the whole light of English opinion were concentrated on the face and figure of Norah Fitzmaurice, the Irish land question and the Irish race would be better understood than after years of debate and libraries of blue-books. Here is a young orphan girl who, when she attends mass on Sunday, has to be guarded from outrage by sixteen policemen. Yet she lives in her old home, surrounded by the relatives and friends of her childhood, and she kneels in the chapel where she and her family have worshipped for generations. She is a farmer's daughter; she is a Catholic, like all her kin; and purely Irish in race and name. On one Sunday, when she entered the sacred edifice, two ringleaders rose, gave a signal, and fifty of the congregation left the building. This 'boycotting' does not cease during the week; she is an outcast among the neighbors, leading a desolate and forlorn life. Every one remembers the pathetic figure of Hester Prynne in Hawthorne's wonderful tale of "The Scarlet Letter"; how the woman moved about with the stigma of her offence upon her, a thing of shame, pity and dread to all, young and old, who caught sight of her pale face and lovely form, mingling among the people like the ghost of a dreadful sin, haunting the sunshine, and casting a chill shadow on the souls of men. In that case the wife so doomed to a kind of life-in-death had committed adultery, and the stern rigor of Puritan times affixed on her a terrible sentence. But Norah Fitzmaurice is an innocent girl. It was her misfortune not her fault, that one morning she went with her old father to the market. They had not left their home many miles when two men — neighbors and friends — followed them. The father fell back to talk to them, and then the daughter saw him shot before her eyes. He died in agony in a few hours. She had to speak the truth in a court of justice, and identify the men. This is her only offence. For this she is denied by her neighbors the common necessaries of life. They will not speak to her or greet her; without police escort she is not safe from the emissaries of the league. One day or night without protection would be fatal to her. All the sympathy of the people is with the murderers, who were cheered on arriving at the county jail; all their hatred is reserved for the poor girl who saw her father murdered before her eyes. We ask English women, English wives, English daughters, to realize this horrible perversion of the instincts of humanity; this political agitation, which has turned a naturally kind-hearted peasantry into cruel and cowardly brutes. What would an Englishwoman feel if politics here ran so high that gray hairs dabbled in blood excited no pity, that the daughter of a murdered man should be hunted and haunted, her grief mocked, her sorrow made her crime, her prayers as she kneels at God's altar disturbed by organized riot? Yet that is what this young Irish girl has to endure because her father sinned against the unwritten law of the league and was killed for disobeying it.

A PUBLIC WORKS DEPARTMENT IN THE UNITED STATES.

Lookout Tower near Eisenach. From Arkitektonische Rundschau.

IN the United States of America, national public works are carried out in a somewhat peculiar and not altogether satisfactory manner. Taking, as an example, river and harbor improvements, and which probably constitute the largest portion of these works, we find that each year a number of schemes are embodied in a River and Harbor Bill, and are presented to Congress to secure its approval as national undertakings, and the right to annual appropriations for their execution. Of course every district is desirous to have the improvement of its waterways carried out at the public expense, and hence the schemes are often local and isolated in their character, and are supported or opposed by the senators, to some extent at least, from motives of local patriotism and interest. The result is that many valuable projects do not get the consideration they merit, because they fail to enlist active sympathy, while others which are more successful are not sufficiently wide reached, and are treated in too narrow a fashion. Waterways, to be of much utility, must form part of a well-conceived plan giving an avenue of communication over long distances. It is for long transit that they are specially valuable, and though it is, no doubt, gratifying for local traders to be able to force down the charges of the railway companies by fostering the competition of canals and navigable waters, yet money spent upon a part of a waterway without regard to the remainder of it, is often partly wasted.

When a project has been approved, and an appropriation has been made for it, it is customary for it to be carried out by the Corps of Engineers of the United States Army, with the aid of civil assistants to perform duties of less responsibility. The officers are trained at West Point as military engineers, and are allotted to the various works by the President. It does not appear that their education is specially directed to the construction of civil works, and it not unfrequently happens that their assistants have had greater experience than themselves. Yet in spite of these disadvantages, the Corps of Engineers have done an immense amount of work, for we find that up to the end of 1882 the United States Government had spent on civil works the large sum of £78,966,000 sterling, of which £21,000,000 had been spent on rivers and harbors, £18,000,000 on forts, arsenals and armories, and £17,000,000 on public buildings. The civil engineers of America have had very little connection with the Government work. It is only the inferior offices which are open to them, the pay is poor and the credit naturally goes to those who stand at the head of the enterprise. Consequently the military men have had the direction in their own hands, a most extraordinary feature in such an unmilitary country. With the exception of England every Government of importance maintains an engineering service for the purpose of carrying out the works which are held to be matters for the State to attend to. But even in Germany and France the constitution of such services is essentially civil, while in India, where from motives of economy military engineers are largely utilized in the Public Works Department, the administration is civil and the prizes are divided between the two elements of the service, both officers and civil engineers being capable of holding the higher positions. The system in vogue in America is viewed with considerable dissatisfaction by the civil engineers of the country, who feel that it is alien to the ideas and methods of the American people, and that it works badly both for the profession and the general welfare of the commonwealth. In England we have no military engineers engaged on civil works to raise feelings of jealousy, but we know that in India there is often a good deal of friction between the two branches of the Public Works Department, although they have both the same professional status. This feeling must be greatly intensified in a country where all the great State enterprises are monopolized

by military engineers, who will consequently rank higher in public esteem than those who are confined to private enterprises. This is, no doubt, a substantial grievance, although of a purely sentimental kind. But we fear it is one which must be borne in mind, unless other reasons can be found for instituting a new system. If the Government find that they get their work well and cheaply done they will scarcely be disposed to change their method of operations simply because the civil engineers are jealous of the prestige of their military brethren. The present method, however, is attacked on far wider grounds than these.

It is contended that the system of organizing State works is founded on a wrong basis. What is wanted, in such a case as that of rivers and harbors, is that there should be a scientific department of the Government who should take charge of the entire country, and carry out the improvements on a systematic plan. This department would have no local prejudices, but would treat each waterway as a whole, getting out a complete scheme which would utilize the natural advantages of the river to the utmost, and render it of the widest possible service. Before an appropriation was asked for, the plan would have been subjected to the careful scrutiny of all the chiefs of the department: its merits and disadvantages would be discussed; its cost would be estimated with the greatest care, and Congress would have the assurance that the money they were asked for was to be expended on a project that would be of great public utility, and would be laid out in the most economical manner consistent with efficiency. This is just the opposite of what occurs now. Plans are included in the general bill without due consideration, and are conceived, to a great extent, from a local and limited point of view. If they are accepted by Congress they are carried out by men who are not responsible for their inception, and who have not the power to change their essential features. The result is that the national funds are spent in an unsatisfactory manner, and that the improvement of one part of a river often proves a detriment to the remainder.

The civil engineers of America, as represented by the Executive Board of the Council of Engineering Societies on National Public Works, while desiring to abolish the present plan, do not propose to follow the method we adopt in England of leaving everything to private enterprise. On the contrary they would have a more highly organized official engineering department, capable not only of carrying out works, but also of inaugurating them, subject to the approval of Congress. As a preliminary measure they limit the jurisdiction of the new department to rivers and harbors, as these are works which suffer most from the present system. The department which they seek to create is to be open, as regards the lower grades, to all who can succeed in entering it by competitive examination. Promotion will be controlled partly by examination and partly by selection until a certain stage is reached, by which time it is assumed that the non-competents will have been weeded out, and only reliable men will be found in posts of responsibility. After that, seniority will govern the advance of candidates for the highest ranks. This method, however, will not avail for the creation of the department. This is to be effected by transferring about one-half of the present army corps to the new department, and by selection of civil engineers at present in independent practice. The present civil assistants would fill the lower posts. It is estimated the cost of the proposed Corps of United States Civil Engineers would not greatly exceed that of the present establishment, while it would be far more efficient, partly because it would consist of men trained for the work, partly because the civil assistants would have an assured future and would not leave as soon as they became efficient, and principally because the initiation of new enterprises would be in the hands of a technical staff, instead of those of committees and other irresponsible bodies.

It is impossible not to sympathize with the desire of the American engineers to see the public works of the country carried out in a better manner than at present. The employment of military engineers for such projects was probably very defensible at the time it was commenced, and possibly for long afterwards. They were systematically educated at an academy kept up at the Government expense at a time when there were but few other facilities for engineering instruction in the country, and no doubt their scientific attainments were superior to those of the average civil engineer. It is true that a good deal of their period of study must have been taken up by purely military matters, but in spite of this they acquired a knowledge of science and the principles of construction, which prevented them going far astray, even when commissioned to undertake work outside of their special experience. The days of specialism had scarcely arisen then. Now, however, each department of engineering has become highly organized, one man taking this department and another that. The all-round man is dying out, and the military engineer, who is equally ready to build a fort, bore a cannon, construct a railway, or canalize a river, finds that his work will not stand the criticism of those who profess to do only one of these things. Modern enterprises become so vast that it is imperative they should be conducted with all the skill which comes from long training and exhaustive study of a particular subject, and hence the petty economy of utilizing the time of the soldier during periods of peace ceases to be worth consideration.

But if it be important that the engineer of a project be a man of great experience, it is far more important that the ends which the undertaking is designed to attain should be commensurate with the expense, and should be as wide-reaching as possible. This is a result which we endeavor to secure here by leaving all such work to private persons, who are supposed to be the keenest guardians of their own interests. But in America this method is impracticable in many instances, especially as regards waterways, and hence the necessity of providing a technical tribunal to decide on the merits of all plans, and to undertake the responsibility of their execution. This is what we do ourselves in India, and what is done by all the great Continental Governments, and it is only a question of time before the same method is adopted in the United States.—*Engineering.*

SPONTANEOUS COMBUSTION IN SHIPS' CARGOES.

CORNICE FROM THE CHURCH OF SAINTE-CROIX, AFTER DECORATION

DR. W. DORING, Royal Instructor of Navigation at the Deutsche Seevarts, Hamburg, recently published a most interesting paper upon the subject of fires on shipboard and the best means of preventing them. The Hydrographic Office, in view of the importance of the subject, has prepared a translation of the paper, of which the following synopsis has an indirect interest for architects:

Conditions of Spontaneous Combustion.—In order that combustion may exist there must be both a combustible material and something to maintain combustion. Air usually does the latter. When wood, etc., burns, the carbon and hydrogen of the wood unite with the oxygen of the air, and produce water and carbonic acid, two of the best extinguishers. Remembering this, one should at the outbreak of a fire in the hold stop every hole and seam as closely as possible, both to keep air from going in and to keep the smoke from getting out, for smoke contains carbonic acid, a more powerful extinguisher than water.

Steamers should be fitted with pipes whereby to introduce steam into the hold and drive the air out. How successful such a course would be is indicated by the case of the American bark "*Prairie Bird*," Captain Sanford, at Key West, in 1875, loaded with cotton. She got a steamer to blow steam into her hold for three days, and although badly burned, the fire was completely overpowered.

Acids.—Underwriters object to their being carried in the hold. They should be carefully stowed on deck, and a clause should be put in the charter, "with liberty to throw overboard for the safety of the ship, if necessary." Slaked lime neutralizes these acids, as well as chalk, soda, potash, etc., and a vessel should always have a quantity of some of these on board ready to use if she is to carry acids. The volatile and inflammable nature of ether, benzine, etc., should always be considered as dangerous to the safety of the ship.

The following articles are subject to spontaneous combustion when allowed to absorb moisture: Saltwort, bone-dust, charcoal, chocolate, roasted chicory, roasted coffee, grain, raw cotton, cotton offal, fibrous plants, animal substances of all kinds, jute, flour, guano, hay, hemp, flax, lamp-black, glue, tow, grits, old rags, cotton (especially dangerous after being used about the engines), oil-cake, oil-cloth, paints, printer's black, coal containing sulphuret of iron, loaded during wet weather, and not protected afterwards against moisture.

The following are dangerous on account of spontaneous combustion through sublimation or the escape of vapors: Bituminous coal; several varieties are markedly apt to evolve inflammable gases (hydrogen), so that an explosion is apt to result whenever an open light is brought near. This coal is not to be confounded with that containing sulphuret of iron. The gases should be conducted out by prearranged ventilation. Guano also evolves much gas when damp, and is dangerous near a light.

Spontaneous Combustion of Coal.—Professor J. Von Liebeg writes a letter in which he suggests covering the coal with a thin lick of tar, to shut out air and water. He remarks that large lumps are not so dangerous as small ones, and hard ones are not so dangerous as those that break easily, and that in all cases of spontaneous combustion on record the coal contained sulphuret of iron, which, he says, can be detected by the eye in numerous small yellow spots.

Preventive Measures.—Lay at least six inches of dunnage, work the pumps carefully, and supply masts, pumps and hatches with a double covering of tarpaulin. Ventilators to lead off the gases in all kinds of weather, fitted in the deck to reach the coal, but not down to the bilges, for if the fresh air is allowed to circulate through the coal it will only heighten the danger which it is intended to obviate. The ventilators should be at each end of the compartment, and not alongside of each other.

On long voyages the temperature of the cargo should be taken and logged each day at several places. This can be done with an iron rod jammed down into the coal, or, still better, with a hollow iron or brass-pipe, inside of which a thermometer can be lowered.

Dr. K. Broockman writes to the author and sums up his conclusions in one sentence: "Coal-gas explosions can be prevented by ventilation."

His conclusions are as follows:

1. Ship only hard coal, for the softer and more friable the coal is the greater is the volume of gas thrown off.

2. Compartments in which coal is stowed must be well ventilated, allowing all gases to pass off into the outer air. Simple pipe as thick as one's arm ought to suffice; perhaps one could utilize the ship's motion.

3. The compartments should be entered only with a safety-lamp, such as is used in mines. There is no absorbing substance for methan or marsh-gas.

4. Freshly delivered coal is much more dangerous than that which has lain for some time in free air; the gases in it are often under an enormous pressure (thirty atmospheres), so that large pieces sometimes blow off, endangering the lives of workmen.

5. Methan or marsh gas is odorless.

From section 4 it appears that the hatches should not be closed as soon as the coal is stowed, and that one should not enter the hold with open light; the same applies to the cabin or forecastle when they are between decks.

Since this gas is odorless one should not even use open lights later on during the voyage; safety-lamps are much more to be recommended.

THE OLD STATE-HOUSE AT RICHMOND, VA.

THE old capitol at Richmond is a veritable curiosity shop — a mine of wealth to the antiquarian who does not care to go back of Pocahontas and John Smith. One can see there old deeds and records dating back to 1620, when Virginia's capital was at Jamestown. They were curious looking old things on parchment—nothing left but the seals and the moulds. The writing became illegible half a century ago. The old building itself is 103 years old, its corner-stone having been laid in 1785. Thomas Jefferson brought the design from France in 1801, and with it a model, that of the Maison Carrée, an ancient Roman temple at Nismes, France. Exteriorly the model was faithfully adhered to, but the interior, of course, had to be adapted to circumstances. It is a quaint old building, and so dirty. The colored population of Richmond seems to have full possession. Apples, cakes, pies and all manner of catch-penny viands are thrust at one from every niche and cranny. Beggars, hideous cripples, all sorts of helpless folk assail one at every turn, and the smell of it all is dreadful.

But for its historic interest and the value of its contents the progressive Virginia of to-day would be justified in setting fire to it, the more so as it occupies the only site available for a first-class modern structure. The basement floor, with its little seven-foot ceiling, its creaking doors, with old cast-iron locks, its brick-flooring, and its array of negro pedlers, is not inviting. Here are the auditors of the State of Virginia, the treasurer and register of the land office. The walls are begrimed, the carpets cheap ingrain, and the furniture was made in 1836 — so a guide said, and his story was believed. The superintendent of the land-office, having but little now to do, is *ex-officio* custodian of the State-house. His land duties and his custodianship seem to sit alike lightly on his shoulders. What they call in Richmond the "rotunda" of the capitol is the floor above. It is about three times as large as one of the elevator cages in the Chicago City-hall.

In the middle, surrounded by a heavy iron rail, stands the one great authentic and authoritative likeness of Washington. This is the great Houdon statue. Houdon was a French sculptor, sent over from France in 1785 by Lafayette. The General Assembly of Virginia employed him at Lafayette's request to make a life-size picture and portrait of Washington as he then existed — the retired soldier and president. M. Houdon spent two weeks at Mount Vernon, took a cast of the Washington face, measured his head, his body, his legs, and got a fac-simile of his cane, his ruffle and his shoe-buckles, and the result was, in two years more, the famous statue. No representation of Washington now extant is supposed to be so natural as this. For many years the government has accepted M. Houdon's likeness as the one to be put on bonds, postage-stamps and all other public prints. The 2-cent postage-stamp is an exact reproduction of the profile of Houdon's face of Washington, and as such not an American soul that ever writes and mails a letter can fail to see and know it. There are some *replicas*. One is in painted copper in the capitol at Washington. Another in plaster is said to be in Albany, New York. None of these can equal the original, as it stands to-day, in that old Richmond capitol. A rickety iron railing surrounds it. The brick floor is covered with orange peels and banana skins. Colored beggars assail the visitor, book-agents badger one, the iron railing itself is rusted, the great statue has a greasy and moldy look — not soiled, but dingy with age. From the gallery above, where the portraits are, the top of the head is seen to be covered with dirt half an inch thick. There seems to be something wrong about it all. The old portrait-gallery is better preserved. Here are the canvases of all of the old governors of Virginia from Lord de la War and Alexander Spotswood down to Gil Walker and Kemper. All have their names on the frames except Gil Walker. His magnificent white hair and moustache are left to speak for themselves. Moreover, the frame containing his picture is put in the nethermost corner, where he who runs will have to know the man and read quick to know his identity. They have put Kemper's name on his picture because he was a Virginian, but it is put well up out of sight. The succeeding governors have not yet been honored.

But the whole of one end of the quadrangle has been cleared to honor some other people. Here appear the pictorial evidences of Virginia's pride and boast in the last half century. There are but three pictures, but they take up all of one of the four sides. The Spotswoods, the Masons, the Randolphs, the Monroes, the Tylers, even Jefferson, Washington (by Peale), "Light Horse" Harry Lee, Lord Dunmore, Patrick Henry,— all have to submit to a "doubling up" to make room for the three great life-sized portraits which Virginia patriots felt they must buy before they adjusted their debt.

That of Robert E. Lee is a magnificent work. It is a full three-quarter figure, life-size, the study made while he was president of the Washington and Lee University. The frame is massive and it occupies the centre of the space. To the right is another full-sized painting of Stonewall Jackson. This is in full confederate uniform, the only one of note, by the way, that is so represented. To the left is the third great Virginia soldier, General Joseph E. Johnston. Like General Lee he is portrayed in citizen's dress, the figure being a three-quarter drawing, life-size. General Johnston looks in the picture just as he does in the office of the United States railroad commission. He doesn't seem to have grown an hour older. Smaller portraits hover about these, notably A. P. Hill, Jeb Stuart and General Pickett, of Gettysburg fame. The old darkey guide, in taking one around the gallery, is prolix when he comes to the colonial governors and Thomas Jefferson, but as he approaches the great portraits he simply says: "Gineral Lee, Gineral Johnston and Old Stonewall," and then the miserable old hypocrite puts his handkerchief to his eyes. He thinks that is good for another Northern dime at least.

One gets somewhat inspired with the glory of "Ole Virginny" it must be confessed, as he goes through the corridors. In a recess near the portrait of Washington by Peale, is the old chair sent from England in 1790 for the use of the Speaker of the House of Burgesses, then meeting at Williamsburg. It is a curious old thing. The back is nine feet high and the seat about nine inches wide. A modern speaker like Sam Cox might sit on its edge, but Carlisle would have hard work, and a fat man like Keifer, of the Forty-eighth Congress, couldn't reach a half-way balance on it. The present speaker of the Virginia House of Delegates might get his coat-tails in it, but no more. It is an odd piece of furniture, upholstered in old-fashioned red silk, so faded as to be colorless. The top of the back is a carved sun-burst, and there is a hole through the upholstery that looks as if it might have been made by a bullet. The old chair was brought up from Williamsburg just ahead of McClellan, in 1862, and perhaps a leaden missile did go through it.

The old stove, too, is a great curiosity. It was the first "warming box" ever brought to America. It was made in England in 1770 and sent over by the Duke of Beaufort as a present to the "Colony of Virginia." It was used for warming the House of Burgesses in Williamsburg until the capital was removed to Richmond. It is a "three-st'y" affair, standing seven feet high, but nothing unique in its appearance. It shows simply that the science of stove-making has not advanced much in the last one hundred and twenty years. The same principles of radiation appear in the old Virginia "warming box" that we have in the ordinary wood stove of to-day.

The library, on the upper floor, contains many objects of interest. There are a "lawyer's fee book," kept by Patrick Henry; Jefferson's marriage contract written in his own hand; Lord Cornwallis's parole at Yorktown, signed by himself; Stonewall Jackson's last official despatch, written in lead pencil on the field of Chancellorsville an hour before his death, and a number of other things. — *Correspondence of the Chicago Tribune.*

DANGEROUS WALL-PAPERS.

EVERY now and then some incidents come to light which show that we are surrounded by dangers of which we little dream. One of these sources of danger has always been considered the poison which formerly used to be introduced into wall-papers by careless or ignorant manufacturers, and it is with sincere surprise and regret that we hear of renewed suspicion being cast upon wall-papers. The circumstance is all the more astounding as the papers in question are stated to be of English origin, while the accusers are American, and we hope that, for the sake of the reputation of our English manufacturers, the makers of these particular wall-papers

will be able to prove that these various charges are unfounded. The facts are narrated by Dr. Charles Harrington, of the Harvard Medical School, in the Boston *Medical and Surgical Journal*, of March 1, and refer to a purchase of English wall-papers with the manufacturers' guaranty that they are non-arsenical. Dr. Harrington states that tests made after their receipt by the Boston purchaser showed that arsenic *was* present, and accordingly the Boston house objected to receiving and paying for them. The English manufacturer, thereupon, reiterated his claim that the papers were non-arsenical, and in proof thereof sent a testimonial from Professor John Attfield, Ph. D., F. R. S., F. I. C., F. C. S., who said:

"Not one of these samples is an arsenical wall-paper; that is to say, not one of the pigments or color-giving substances on the papers is arsenical, and the paper itself of these paper-hangings is not arsenical.

"Pseudo-sanitarians sometimes report non-arsenical wall-papers as containing some ridiculously-minute trace of arsenic. These alarmists might just as truly report some samples of common table salt as containing arsenic, for the delicacy of certain of the tests for arsenic is so great that traces can be detected in many things. But such traces are absolutely without significance from any sanitary point of view, either in salt, wall-paper, or anything else. Arsenical wall-papers have well-defined arsenical characters, were formerly common, and may now occasionally be met with. Neither of these samples is an arsenical wall-paper."

In order to disprove this very emphatic statement, analyses of these papers were made by Henry B. Hill, Professor of Chemistry in Harvard College; Dr. Charles S. Sanger, Professor of Chemistry in the United States Naval Academy, and by Dr. Harrington, who is the Assistant in Chemistry and Instructor in Hygiene in the Harvard Medical School, and the following table shows the results of their examination as compared with those made by Professor Attfield:

AMOUNT OF ARSENIC IN GRAINS PER SQUARE YARD.

No.	Hill.	Sanger.	Harrington.	Attfield.
1	4.66	4.08	4.40	—
2	0.85	0.73	0.90	—
3	0.93	0.73	0.82	—
4	0.63	0.71	0.78	—
5	0.21	0.23	0.28	—
6	0.12	0.04	0.14	—
7	0.10	0.08	0.13	—
8	0.21	0.22	0.22	—

Our contemporary therefore comes to the conclusion that according to the American analyses all of the papers contained more than the permissible limit recommended to the National Health Society of England by its committee, and adds that, in view of the reputation which Professor Attfield has in the United States, this result is certainly very surprising, but that it shows how desirable it is to take such guaranties with great reluctance and caution. The article closes with the following tirade: "It is well understood by pharmacists and chemists that there are always to be found a certain number of chemists holding prominent professional positions who can be depended upon to furnish certificates which favor the interests of those who employ them, but we are loth to believe that Professor Attfield is to be classed among them. He certainly owes it to himself to offer some explanation of such a decided variation between the results of his own analyses and those of the American analysts in the present instance." Professor Attfield holds a well-earned and spotless reputation in this country as well as in the States, and we feel sure he does not belong in the category of the "certain chemists" of whom our American contemporary speaks so pointedly. We, therefore, feel sure that he will be able to clear himself from such insinuations, but we should like to go farther and ask, who were the manufacturers of these papers, and what have they to say to so serious a charge? It is a question which is of importance to all English makers of wall-papers, whose good name has been placed in jeopardy amongst our American cousins, and we hope that they will take the matter up in a proper spirit. — *Invention.*

BOOKS AND PAPERS

DURING the last half-dozen years which have seen the annihilation of uncountable dry-plates, innumerable questions have suggested themselves as to the whys and wherefores of the many provoking failures we have made in photographics. Working spasmodically, as rare idle moments presented themselves, it is little wonder that perfect success was so seldom achieved, but just what it was that sometimes produced perfect negatives, was no less puzzling than what it was that as often produced perfect failures, and it was slowly borne in on our mind that this fascinating art had its foundations in science, and that it would be quite useless to seek the answers to the riddles without first having, with some little thoroughness, refreshed one's memory as to the operation of the laws of optics and the order of chemical reactions. By blindly following the instructions of the hand-books that are prepared for the use of amateurs, a reasonable measure of success rewards the operator, until there comes occasion for leaving the plain road and attempting to work to the desired end with no better guide than an awakened instinct. In such straits as these recourse is had to books, which teach the subject with all desirable thoroughness only to find that they are somewhat diffuse in treatment and voluminous in bulk for a busy man, who is not preparing for a professional career, to spend his time over. There was really a need for something between the slight hand-book and the all embracing treatise, and such a book[1] has been prepared by the editor of the *Philadelphia Photographer* and the writer of several books on photographic methods. It is adapted to the needs of both amateur and professional, and would be a useful hand-book to have in any gallery, and it has one preëminent qualification for such service, it is nearly square in form, and, as a consequence, will open out flat and stay open, as books of the usual shape rarely will.

It is a very curious book in its make-up, a double-headed Briareas which helps with both head and hands. Each paragraph of the author's is paralleled by voluminous extracts from other writers, all bearing on the subject-matter of the paragraph in question. One does not therefore have to stop and go in search of what other authorities say on the point, it is all brought together here in one place, and the book becomes a library of books on photographics, but one in which the differing views are, in a sense, already digested and assimilated for the student.

Text and extracts are fully and admirably illustrated, as will be shown by the statement that nearly four hundred cuts, illustrating processes, principles and apparatus, give point and interest to the text and extracts alike. The thoroughness, and what may be called the impersonality of the book, is shown by the list of authorities who have been laid under contributions, a list which includes nearly three hundred names of professional photographers and scientific authorities, as well as of amateurs, whose experiments and observations are not the least in value.

A good index, fairly well cross-referenced, makes the book useful for quick occasional reference.

AMONGST the many new trade journals which publishers all over the country are sending out in never-ending succession, is one which really seems to touch on a comparatively uncultivated field. Brick and wood and iron have long had trade papers devoted to the development of their respective interests, but we cannot recall that any one has, until now, turned his attention to the attempt to wring fortunes from stone through the agency of printer's ink. Handled seriously, the chance of making a useful and successful journal seems to lie within the reach of the publishers of this one,[2] and one from which architects especially may derive much benefit.

The vast deposits of the most varied kinds of building stones in this country are little known, some not even suspected, others just discovered, and only a few really worked in such a way that the product of the quarry can be really considered "in the market" for the use of any one who prefers, for one reason or another, to use that particular stone. Until within a few years builders used certain stones mainly because they were "handy" to the site, but the increased facilities for transportation now makes it possible for an architect to exercise a limited choice in the selection of his building stone, and we believe that such a journal as this will do a great deal toward very rapidly expanding the field from which selection can be made. There is generally capital enough watching for a chance for investment, and if the editor can point out promising deposits of new varieties there will shortly be many more building stones in the market than there are now.

SOCIETIES

DETROIT ARCHITECTURAL SKETCH CLUB.

THE architectural draughtsmen of this city have organized an association to be known as the "Detroit Architectural Sketch Club," with the object of improving and advancing its members in all matters pertaining to architecture, by competitive drawings and designs, lectures, etc.

The first semi-annual meeting was held Monday eve, May 14th, at which time a constitution and by-laws were adopted, nearly twenty-five members being present. The following officers were elected, viz.: President, J. L. Saunders, from the office of Mason & Rice; Vice-President, A. D. Adamson, from the office of Spier & Rohns; Secretary, C. A. Fullerton, from the office of Messrs. Van Leyen & Preston; Treasurer, J. B. Nettleton, from the office of Donaldson & Meier; an Executive Council consisting of the officers and three active members, viz.: Albert Kohn, of Mason & Rice; M. H. Grills, of Scott & Co., and W. E. Pasco, of Donaldson & Meier.

The club starts out with good prospects and lots of enthusiasm, with the promise of help from the architects. You may expect to hear from us soon. Sister clubs, the hand of good fellowship is extended. Address communications to

C. A. Fullerton, *Secretary*,
18 and 19 Burns Block, Detroit, Mich.

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[1] "*Wilson's Quarter Century in Photography.*" A collection of hints on practical photography, which form a complete text-book of the art. By Edward S. Wilson. New York: Edward S. Wilson, 853 Broadway, 1887.

[2] *Stone.* A journal for producers, workers and users of Stone, Marble and Granite. Published monthly by the D. H. Rauck Publishing Company, Indianapolis.

COMMUNICATIONS

STRENGTHENING OLD FLOORS.

NEW YORK, May 7, 1888.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Will you be kind enough to inform me as to the utility and desirability of the following method? I refer to the *American Architect*, No. 628 (January 7th 1888), and in particular to the latter part of Article XXI on "Safe Building," treating of cross-bridging. It is mentioned that in case the floor-beams in an old building have settled, and provided the beams are still strong, that it is a good method to put wedged-shaped blocks between the beams, bore the beams and run an iron rod through them between the lines of wedges from the outer beam at each end of tier, and by screwing up a nut at one end, bring the whole series of beams up to a level and if desired somewhat crowned or cambered. Now the point I would like to bring up is, whether in building a new house, say an ordinary twenty-five-foot city dwelling, it would be a good plan to substitute for the usual cross-bridging in each tier of beams, blocks just such as are mentioned but not wedged-shaped, merely inserted tightly between the beams, and with the iron rod, washer, nut, etc., used in the same way. Also, would it be well to camber the beams a trifle, by using very slightly wedge-shaped blocks? It seemed to me this method would give to the floor beams of each tier, a unity as regards their strength and stability and to modify somewhat the problem of settlement particularly in the upper stories. By giving your opinion on the above you would confer a great favor on a subscriber. E. K. B.

[THE iron tie-rod would be a very useful addition to the bridging of a floor. With it we should, however, prefer well-nailed and well-fitted cross-bridging to the solid blocks, which are sometimes used. — EDS. AMERICAN ARCHITECT.]

PROVIDENCE, R. I., SEWERAGE SYSTEM.

TORONTO, CAN., May 19, 1888.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Could you inform me through the columns of your paper where I could obtain a copy of the regulations respecting the construction of the sewerage system for Providence, R. I., and oblige, Yours very truly, GEO. H. RICHARDSON.

[ADDRESS Samuel M. Gray, City Engineer, Providence, R. I. — EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS

THE "CANALS" OF THE PLANET MARS. — People who can obtain the privilege of looking at Mars through the Lick telescope should not neglect the opportunity. Several years have elapsed since that remarkable planet could be seen to such advantage as at present, and it will be three years before we have an equal chance again. It has certainly never been examined before through a telescope of such power as the monster refractor on Mount Hamilton. It may be interesting to lovers of astronomy to know that the eminent French astronomer, M. Perrotin, is engaged in a minute study of Mars, and that his discoveries confirm those of M. Schiaparilli in every particular. It seems actually true that the longitudinal stripes which circle round the planet are bodies of water, and must, according to all laws of probability, be artificial. No one ever saw or conceived a system of parallel rivers from 1,000 to 2,000 miles long and straight as a plumb line. Everything is possible of course, but such straight rivers it is impossible to reconcile with the principles of cosmogony as we understand them. On this planet, at all events, nature abhors a straight line, and by analogy it should do so in Mars. Yet, if these bodies of water are canals, as Schiaparilli believed and Perrotin seems hardly to doubt, what monstrous works they must be! They are from fifty to eighty miles wide. Fancy the labor of digging such a canal, the time it must have taken, and the number of workmen it must have employed. The pyramids of Egypt are trifling in comparison. The Suez Canal is 197 feet wide at the surface, and the Nicaragua Canal is to be 150 feet; the Martial canals are 2,800 times wider. Our canals on this one-horse globe are considered long when they reach 100 miles in length. The Panama Canal will be less than 60 miles long. The canals of Mars reach a length of 2,000 miles — say as far as from here to Omaha. What a traffic there must be to support such enterprises! On the waterways of China travellers describe the incessent ebb and flow of multitudinous crowds, but to require canals of such dimensions as we have described, the movement of traffic in Mars must be far more prodigious. In fact, they imply a population which almost staggers belief; considering that the volume of the planet is only one-sixth that of the earth, the diameter being 4,400 miles as against 8,000 miles, they warrant the wildest conjectures as to the density with which it may be peopled. What manner of man live in Mars, if there be men there, has always been a favorite topic of speculation. The law of gravitation tells us that he may be fourteen feet high; not such a son of Anak as the inhabitant of the asteroids, but still one who would regard the Belgian giant as a remarkable dwarf. Possibly the enormous public works on Mars may be explained on the theory that these tall fellows can work in proportion to their stature — that one citizen of Mars can shovel as much dirt as two and a half denizens of this world. Whether the grass of Mars is red, as the old astronomers averred, modern telescopes have failed to decide. It is very difficult to determine colors when an object lens collects thirty thousand times as much light as normally enters the human eye. But the speculative astronomer is safe in asserting his belief that Martian cabbages are of the color of our beet-roots, as no one can disprove the assertion. — *San Francisco Call.*

MR. WILLIAM MORRIS ON MODERN ARCHITECTURE. — Mr. William Morris, writing in the *Fortnightly Review* for May, expresses the opinion that there has been, in this century, something like a revival of architecture. Does that revival, however, indicate "a genuine growth of real vitality," or does it merely point to "a passing wave of fashion?" Mr. Morris's own view is that the revival is too limited in scope, too much confined to an educated group, to be regarded as a vital growth capable of true development. He commends Mr. Robson's "simple but striking" London Board Schools, Mr. Norman Shaw's "elegantly fantastic" Queen Anne houses at Chelsea, and Mr. Bodley's "excellent" new buildings at Magdalen College; but these, he holds, are mere eccentricities with which the general public has "no part or lot." Nor, we gather, does he believe that things will be any better till the everyday work of the population ceases to be mechanical drudgery, with which, in his opinion, our existing architecture is only too thoroughly in harmony. The explanation of our weaknesses in this direction is not so obvious and easy. The reason lies partly in our climatic conditions, which are unfavorable to any style of dwelling not solid and durable; partly in the lack of a general sense of beauty and appropriateness; and partly in the daily growth of our numbers, which tends to the constant "running up" of tenements at once cheap, flimsy and ugly. Matters would be different, no doubt, if our system of local government enabled men of taste to put a veto upon unnecessarily ill-favored edifices. A large proportion of the buildings erected are quite gratuitously hideous, and they are so simply because we English are not naturally endowed with artistic eyes. — *London Globe.*

ONE WAY TO CURTAIL TOO LOFTY BUILDINGS. — The more the public hear about the monstrous building which it is proposed to erect at Albert Gate the less do they understand how the Metropolitan Board of Works came to sanction such a disfigurement. Its apologists plead that it will rise to a height of only 115 feet above the ground. But this measurement does not include the roof, which will certainly add another fifteen or twenty feet. Then there are to be "small towers or pinnacles" on the top of all, so that the total altitude will not fall much short of 150 feet, even if it does not exceed that elevation. Such is the edifice which, unless something is done, will presently dominate the southern side of Hyde Park as the Wellington statue and its nose used to dominate Hyde Park Corner. Can this outrage be prevented? The promoters suggest a monetary arrangement; they are willing to sacrifice their rights in return for a consideration. We think we know a more excellent way. The Commissioners of Works have the power of building a wall on the Park side of the site, thereby blocking the view. Let the foundations, then, be laid with all possible despatch, and we make no doubt whatever that, by the time the wall rose to the top of the ground floor, the promoters would be ready to reduce their terms. If they proved obstinate, the wall could be carried up to the top of the first floor, reducing its letting value by at least one-half. It may be said, perhaps, that the wall would be every bit as hideous as the eyesore it hid. Granted; but the public conscience would be appeased by a sense of just revenge. We care not what the æsthetic charms of the edifice may be or whether it would cast a shadow to Hampstead Hill, or to the Serpentine. *Fiat justitia ruat cælum;* let the top stories be knocked off, or up with the blind wall. — *Exchange.*

THE ROMAN WALL OF LONDON. — Yesterday a large assembly of antiquaries and archæologists took place at a spot in Aldersgate, a little to the north from the new buildings of the General Post-office, for the purpose of inspecting a portion of the old walls of the city, close to what was in all probability their northwestern angle. This portion was first discovered and laid bare in the early part of last autumn, when the Bull and Mouth Hotel and the French Protestant Church were removed in order to make room for the intended additional buildings. The length of the wall now exposed to view is about one hundred feet, and the greater part of it stands about ten feet above the soil. This is largely mediæval; but the portion below the surface soil measures about fifteen feet or sixteen feet, and this is composed of stones and bricks, laid in alternate strata, after the Roman fashion so well known at Colchester and Lincoln, and also in other parts of the walls of London, as for instance in Bevis Marks and the Minories. The material is Kentish rag, laid in regular courses, with fine joints and other courses of red tiles with wide joints. As this wall is actually on the boundary of the building site lately acquired by the authorities of St. Martin's-le-Grand, there seems to be no necessity for its removal, and a general opinion was expressed among the antiquaries present yesterday that the wall is too fine a specimen of Roman work to be wantonly destroyed. — *Pall Mall Gazette, April* 27.

THE MARIA THERESA MONUMENT AT VIENNA. — The monument to the Empress Maria Theresa, which was unveiled May 13, in the presence of the Emperor Francis Joseph and a great company of Austro-Hungarian notables, ranks with the finest memorials in Europe. It is said that in magnificence and perfection of design, in composition and in taste, it surpasses the famous Albert Memorial in London, and it is larger than Rauch's famous monument of Frederick the Great in Berlin. The Empress is represented in a sitting posture, the figure being in bronze, and it is a grand example of the consummate art of the sculptor Zumbusch. Beside the central statue there are thirteen others, of famous generals and statesmen, and sixteen relief figures, representing men prominent in politics, science and art. The whole thing is in bronze, and the monument contains fifty-four tons of the metal. The figure of the Empress alone weighs twenty-three tons. The memorial is sixty feet high, and is an exceedingly imposing structure. — *N. Y. Mail and Express.*

The Gamboa Dam on the Panama Canal. — Mr. Jacobson, an engineer from the Panama Canal, is staying at the New York Hotel. He arrived on the steamer "*Colon*" from Aspinwall, and is on his way to France. Mr. Jacobson is a graduate of the Polytechnicon of Zurich, and has a fair knowledge of English. His position on the canal works was a very responsible one — that of chief executive officer for the Société des Travaux Publics, contractor for that part of the line between Obispo and Emperador, from kilometres 44 to 53,600, and including the celebrated Gamboa dam. Mr. Jacobson has been in the employ of the Société for a year and a half, during which time he has resided on the canal line, giving the work his personal supervision. He returns to France at this time for needed rest, and to arrange personal affairs. In reply to inquiries about the condition and prospects of the Panama enterprise, Mr. Jacobson expressed his entire willingness to give any information in his power, and to pronounce an opinion upon any matter that fell within the range of his observation. He said work had commenced on the Gamboa Dam, which, after long hesitation, was at last decided to be necessary for the control of the Chagres River. Of the 3,000,000 cubic metres of material that the dam is to contain, about 30,000 have been deposited on the opposite ends of the works, at the bases and sides of the two large hills Obispo and Santa Cruz, between which the dam is to be situated. These deposits are far enough from the bed of the Chagres to be safe from the current, even during a freshet. When, however, the work is further advanced, and the centre of the dam is reached, which is to oppose the flow of the current, it is feared that the floods of the rainy season will carry away all the material within their reach. It is Mr. Jacobson's opinion that unless this central part of the dam can be completely finished in a single dry season, it will be found very difficult and perhaps impossible to construct it at all. Mr. Jacobson says, with reference to operations during the rainy season (which has now set in) that little more can be done while the rain lasts than to take care of the yards and material and preserve the work already accomplished. Representatives of M. Eiffel, under the new contracts for locks, have begun work at several points, but the plans, Mr. Jacobson says, are still inchoate, and the number of locks and their final location not yet determined. In the excavation of the locks there will doubtless be obstacles to overcome. Already at points between the forty-fourth and forty-eighth kilometres the excavations made are actually too deep for the lock canal on the proposed level, which will necessitate the construction of dikes on one side to raise the water of the canal above that of the river. In this section the canal is in a plane with the Chagres and Obispo at their junction. That part of the Chagres will be suppressed by the Gamboa dam, and its flow diverted into an artificial channel on the south side of the canal, but a dike of about four kilometres in length and nine metres high must be raised between the canal and the Obispo. M. Eiffel will have no part in any of the canal work, except the preparation for and construction of the locks. The other contractors continue the dredging and excavation as heretofore, except for such modifications as the new project necessitates. The completion of the canal does not, therefore, depend upon M. Eiffel any more than upon any other of the contractors. When asked whether he thought the canal could be completed and open for traffic in 1890, Mr. Jacobson smiled broadly, and said that if the work on the Isthmus could be completed in five years, it would be a great achievement. — *N. Y. Evening Post.*

An Old Chinese Printing Establishment. — A correspondent of the North China *Daily News*, of Shanghai, describes a printing establishment which he found in a village in the interior, about 150 miles from Shanghai. The printing was being temporarily carried on in the village temple, and movable type only was used. In the large central hall of the temple were placed about 20 ordinary square tables, on which the cases of type were spread out, very much after the English method, only taking up much more room. At the time of the visit one man was engaged in setting up type; another was printing. The former stood before a table, on which was what may be called the Chinese "case." It was a solid block of hard wood, about 22 inches long by 15 inches broad, and perhaps 3 inches deep. The inside was hollowed out to a depth of about ¼ inch, this depression being still further hollowed out into grooves about ¾ inch deep. The block had 29 of these grooves, each filled to the depth of ¼ inch with ordinary stiff clay. With his copy before him, armed with a small pair of iron pincers, the compositor began his work; character after character was transferred from the case and firmly pressed into the clay. When the "form" was complete, a flat board was placed on the top and the characters, pressed perfectly even and level with the surface of the wooden block, the edge of which was cut to form the border generally found round every Chinese page. The printer now received the form, and carefully brushed his ink over the type. Taking a sheet of paper, he pressed it down all over the form, so that it might be brought in contact with every character. He then removed the sheet and examined each character, carefully adjusting those which were not quite straight with the pincers, and apparently never touching the type with his fingers. After sufficient copies had been struck off, the type was distributed, each character being returned to its particular box. The type in the form was of three sizes, each character being kept in place entirely by the clay in which it stood. They were cut out of some hard wood, and were perfectly square. The writer was told that the art of printing in this way had been handed down in the same family since the Sung dynasty, more than 600 years ago. No strangers were ever taught, apprentices being always taken from the same clan. They were open to take any work at the rate of about a shilling a day, which included the two men, type and ink, but not paper. They were then printing family registers. The custom in that part of the country is to hire the printers, who bring their type and set up their printing establishment on the spot. In this way the same business has been carried on in one family for six centuries, and during all this time movable type only had been used in the manner here described.

Casting in Steel and Bronze. — The old Hindoo art of uniting different metals by casting has been successfully revived in a Boston foundry, where steel and bronze are the metals dealt with. Those portions of the finished article which are to be of bronze are first cast, and after cooling are removed from the mould, and the surface thoroughly cleaned from all traces of oxide or other impurities. These pieces are then placed in a mould having a form corresponding to that of the finished article, and the vacant spaces are then filled with molten steel, which thoroughly unites with the bronze wherever it comes in contact with it. It is proposed to use this process in the production of firearms, with an inner liner of bronze and an outer jacket of steel; but the prospects of a useful arm being produced in this way do not appear very flattering." — *Engineering.*

Tree Planting Extraordinary. — Mr. Assheton Smith is commemorating her majesty's jubilee in a remarkable manner. He has caused to be planted on the slopes of Moel Rhiwen mountain a plantation composed of 630,000 trees. Nearly 200 men have been constantly employed since the jubilee in planting the trees, which will be so arranged as to represent the words "jubilee, 1887." Each letter measures 200 yards long and 25 feet wide. The first tree of the letter J was planted on jubilee day. — *London Standard.*

TRADE SURVEYS

A good many financial writers are troubled over the decreased earning capacity of the railroads and some of the manufacturing interests of the country. There is no occasion for alarm. One journal publishes the returns of 69 railroads for March, and shows a decrease in net earnings of over three million dollars; and other figures showing a decrease on 87 roads in three months of over five million dollars, as against same time last year. There is also a good deal of anxiety borrowed from the fact that a large amount of money is gathering at three or four important financial centres. One class of writers find great encouragement in the easy money market consequent upon this fact; others see in it evidence of a declining commercial and manufacturing activity; another class of writers and thinkers see in it only a conservative movement upon the part of the business interests of the country. Building activity has suffered along with railroad-construction. Manufacturers in a good many branches are making and selling less. This is notably true in iron and steel. Coal-production is maintained at a high point. The anthracite output so far this year, notwithstanding strikes and decreased consumptive demands apparently, is 200,000 more than at this time last year. The markets for both bituminous and anthracite are increasing in a multitude of small places. The lumber trade is holding its own wonderfully, considering the reports of decreasing building activity from so many places. Where the larger cities are falling off, smaller towns and villages are increasing the demands; where the construction of long lines of railroad is falling off, there is a partially compensating demand in the construction of short lines. Where there is a lull in the demand for large machinery, there is an improving demand for small machinery, motive power and equipments. The year 1888 is a year for the small capitalist, manufacturer and business man; for the small building operator and the small operator generally. In cities like Philadelphia, Pittsburgh, Cleveland, and in several larger and smaller cities farther West, the lists of permits published demonstrate this fact. Small houses are multiplying, and small operations are in progress everywhere. Northern builders are making and taking a good many contracts for the construction of houses in the South, mainly in connection with large manufacturing concerns that are springing up. Builders and manufacturers are putting money into house and shop building in the South under good security. Manufacturers there are putting up houses for their workmen in scores of instances. The architecture and surrounding of these houses are indicative of a spirit of progress; many of them have yards for small gardens; all of them are much more comfortable than the average houses built 20 years ago in the North. The evident intention of the leaders of industrial activity in the South is to make their labor comfortable and create some incentive to individual independence. Without writing a thesis on this subject, it should be said that the departure is a most sensible one, and that the attention given to the material surroundings of the workmen will do more to protect the manufacturers of the South against labor agitations and labor organizations than any amount of organization on their part. A great deal of machinery has been ordered in our leading machinery centres within the past 30 days. It is pretty evenly divided between electrical requirements, railroad machine-shop work, flouring-mill and elevator-work, mining machinery and shop-machinery for distribution everywhere. The manufacturing capacity of the entire country is being increased at a time when there does not appear to be much inducement to increase it. Manufacturers are taking a long look ahead, and are tearing out, renovating and improving and expanding in every direction where economies can be subserved. The lumber manufacturers are carefully restricting the product of their mills, excepting in the Southern States, where, according to recent advices from very many quarters, there is almost a booming demand. The manufacturers of yellow-pine, North Carolina sap, Louisiana cypress, and of lumber all through the intermediate territory, are meeting with an unexpected demand for local requirements. Northern manufacturers are participating in this activity, and profiting by it. Some concerns have already contracts that will keep them busy all season. The effect of this is, to throw less lumber upon the Northern markets and to enable Michigan, Wisconsin and Pennsylvania lumber manufacturers to obtain stronger prices than could be otherwise realized. To all present appearances our railroads will be about 10 per cent worse off in net earnings than last year. Of course there will be a very wide-spread opinion that the results of the next six months will offset this. Foreign trade will do but little to relieve the situation. The abundance of money does not seem to be helping the manufacturing interests. A financial stringency is every now and then predicted. There is a larger amount of floating indebtedness among merchants and jobbers, but it is not threatening. Large blocks of money are coming to this side from abroad for investment. Europe is a heavy customer. The large amount of money that has come to this side during the past nine months, is certainly preventing the export of gold which would otherwise take place It is probable that the industrial depression through which we are now passing will do a great deal of good in bringing prices down to rock-bottom, in checking undue enterprise, in reducing the number of speculative ventures and in creating a generally healthful commercial condition.

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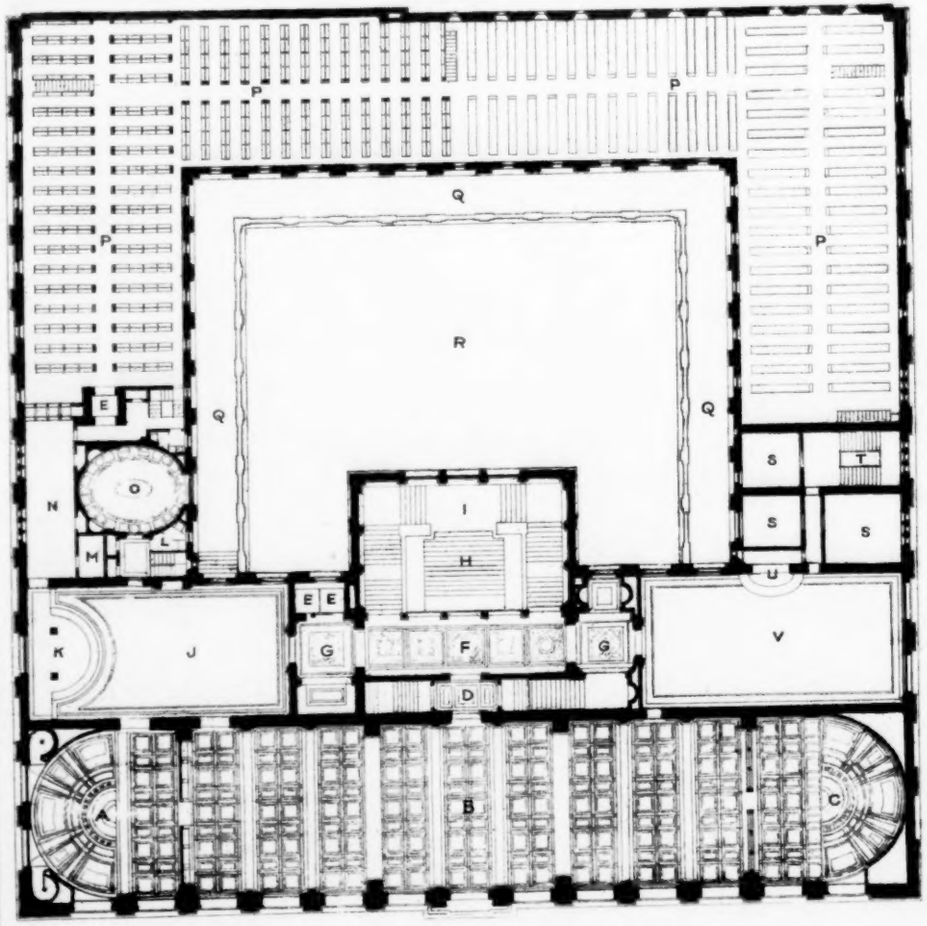
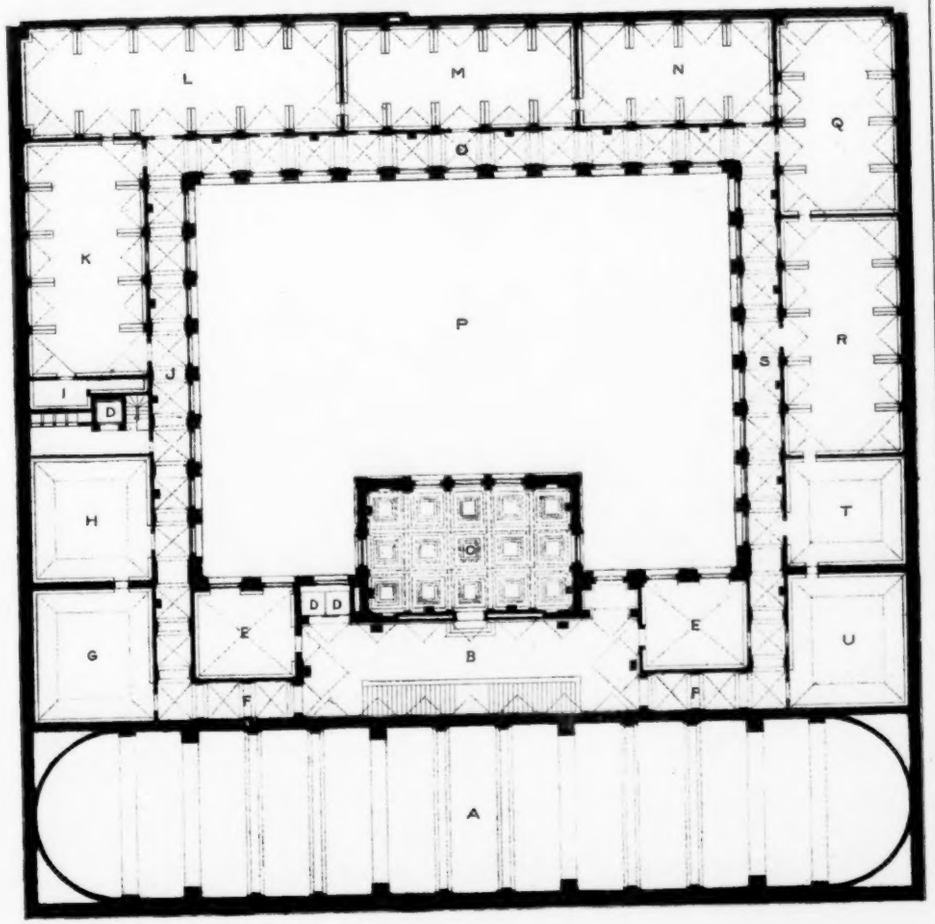
MCKIM, MEAD & WHITE, ARCHITECTS

AND BUILDING NEWS, MAY 26 1888





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B BATES HALL 42'6" × 218'
C WAITING ROOM
D LOBBY 9'-10"
E ELEVATOR 8'-0"
F HALL 15'-80"
G VESTIBULE 15'-0"
H GRAND STAIRCASE
I LANDING 15'-0"
J WAITING ROOM 36'6" × 66'
K DELIVERY DESK
L LAVATORY
M CLOAK CLOSET
N DELIVERY 12'0" × 90'
O TRUSTEES ROOM 22' × 27'
P STACK
Q ARCADE
R COURT
S SPECIAL STUDENTS
T STAIRCASE
U ATTENDANT
V SCIENTIFIC PERIODICALS 58'6" × 65'

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B HALL 29'×84'
C ART ROOM 31'×81'
D ELEVATOR 6'×6'
E RESERVED 22'6"×23'
F EAST GALLERY
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H TECHNICS LIBRARY 50'×82'
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J SOUTH GALLERY 6'×196'6"
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L PATENT LIBRARY 28'6"×76'6"
M BARTON LIBRARY 27'×38'
N PARKER LIBRARY 27'×48'6"
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P COURT
Q AMERICAN PUBLIC DOCUMENTS 30'×70'6"
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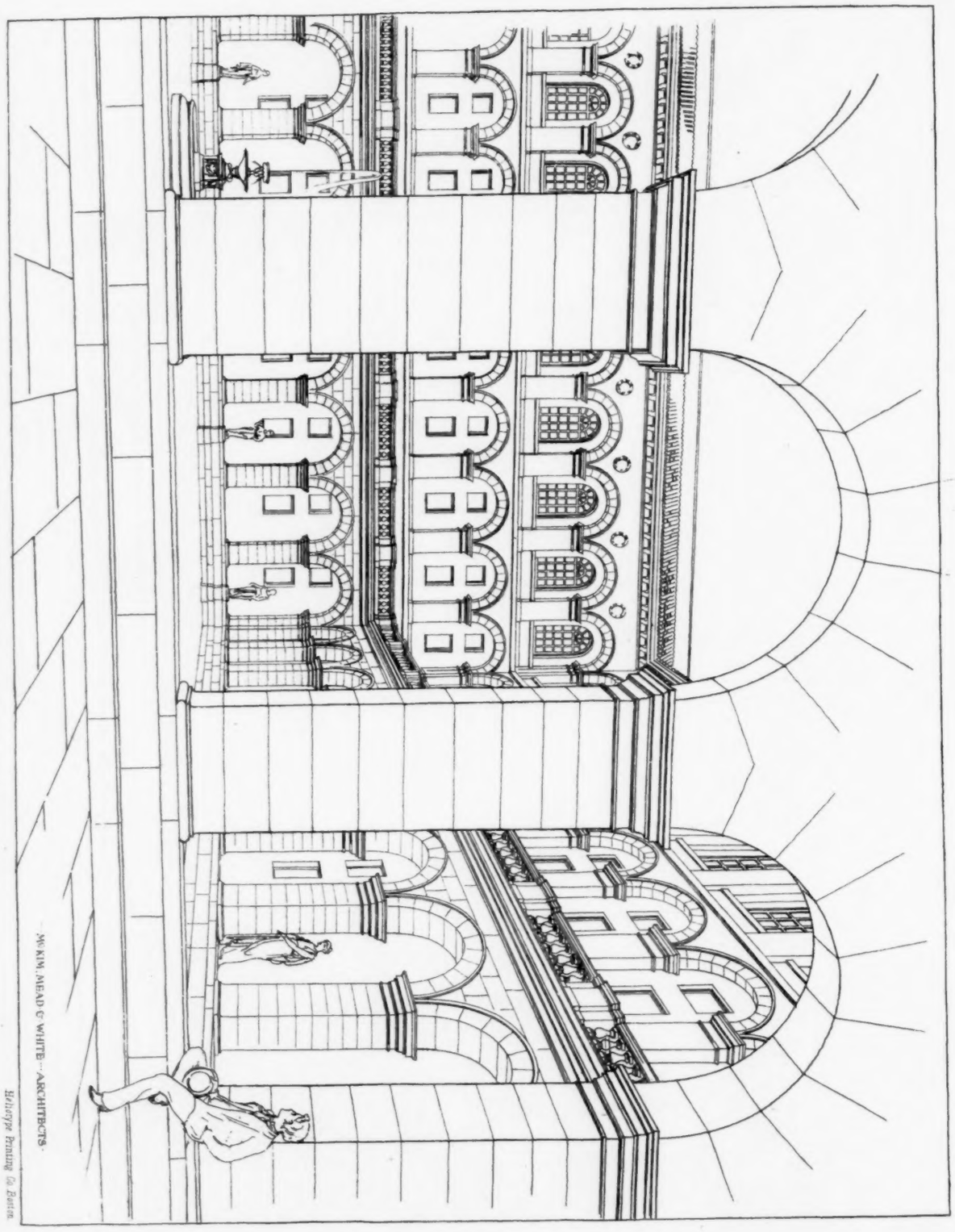

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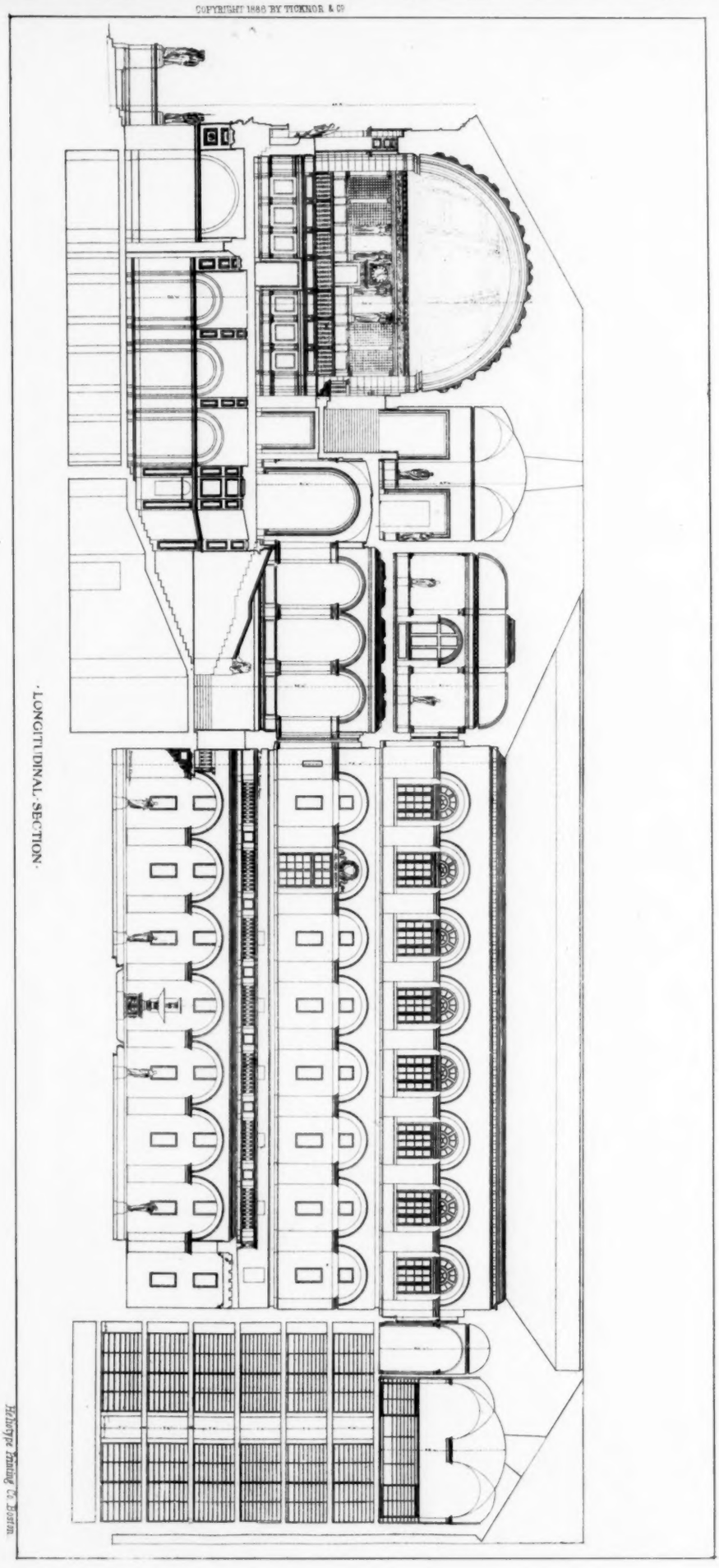

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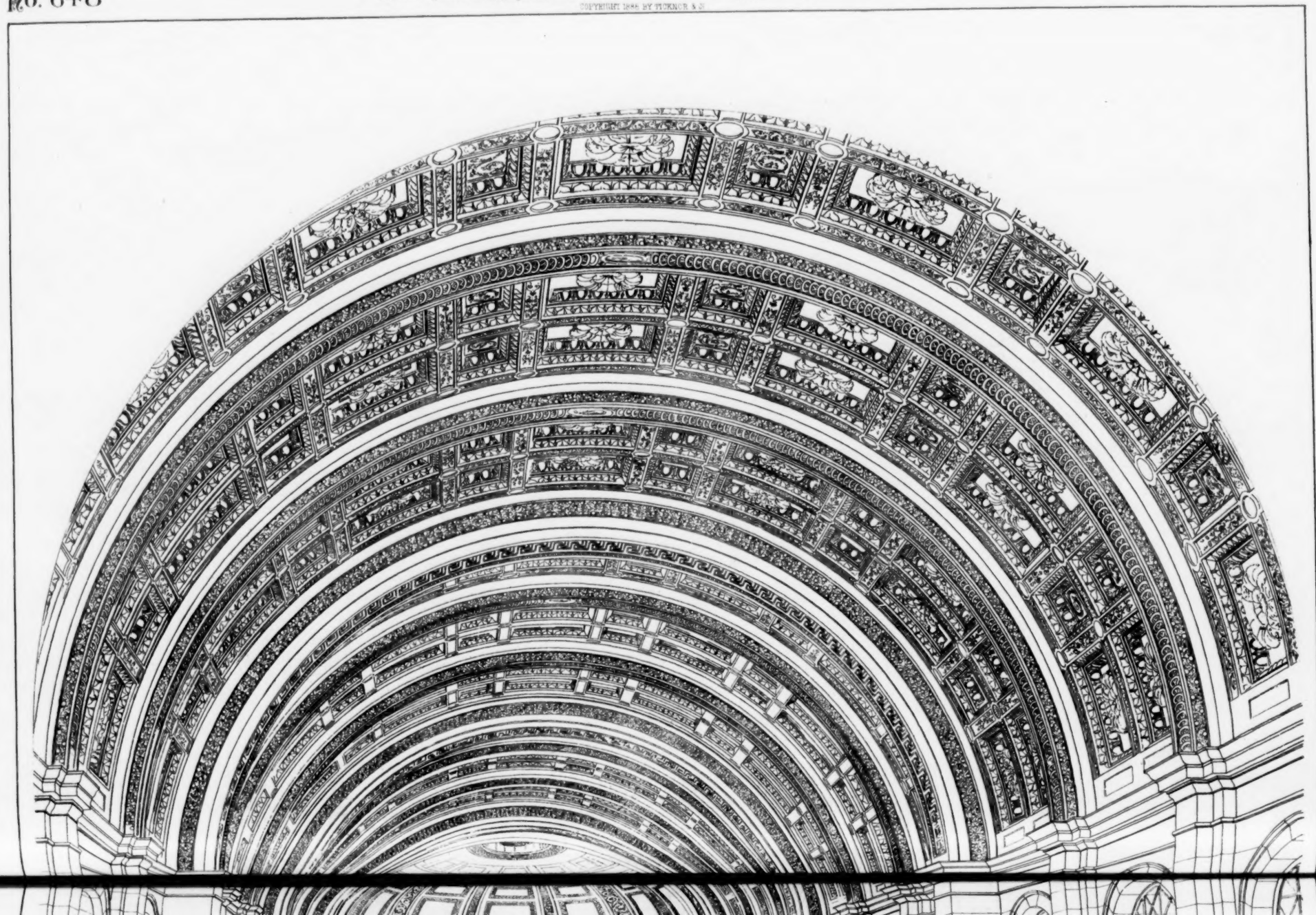

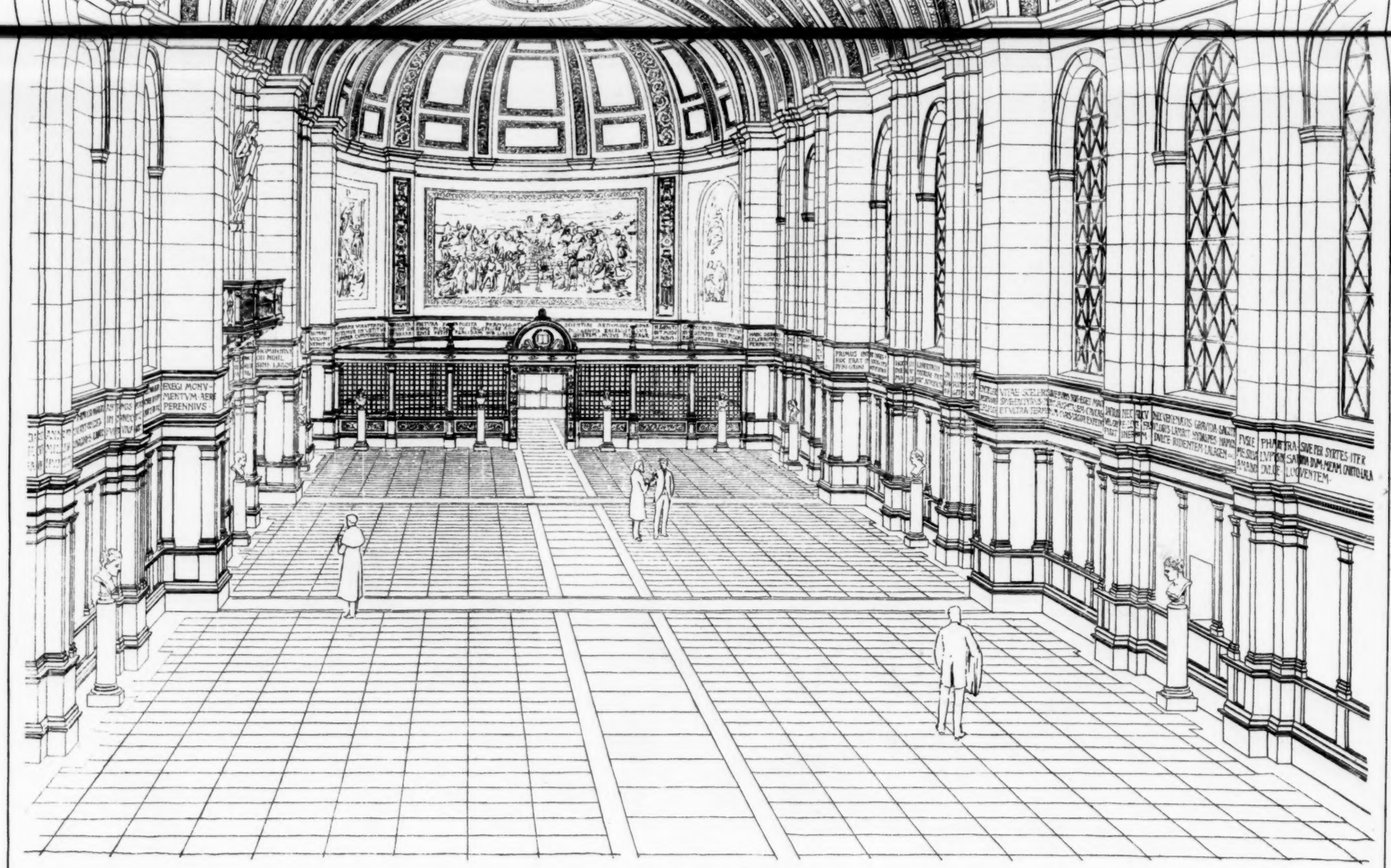

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